

# RUBY DAM

## Manual for Operation and Maintenance

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# **RUBY DAM**

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**State Water Projects Bureau  
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## **OVERVIEW**

Ruby Dam is located in Madison County about 6 miles south of Alder on the Upper Ruby Road. (Figure 1) The reservoir is fed primarily by the Ruby River which originates in the Snowcrest and Gravelly mountain ranges, about 30 miles south of the dam.

The earthfill dam was completed in 1938. Ruby Dam is 111 feet high and 846 feet long. The dam's outlet works consist of a dry tower with a 72-inch diameter cast iron gate valve upstream from a 72-inch diameter butterfly valve used for flow control. The control for both valves is at the top of the tower. The maximum capacity of the outlet is 1,750 cubic feet per second (cfs). The spillway is located in the right abutment. The ogee crest is 125 feet wide and has a capacity of 36,000 cfs.

The Ruby River Water Users Association (herein called "association") operates the dam and reservoir. Water from the reservoir is delivered to purchasers through two canals, the West Bench Canal and the Vigilante Canal. The West Bench Canal is 12 miles long and has a maximum capacity of 173 cfs. The Vigilante Canal is 26 miles long and has a maximum capacity of 182 cfs. In addition to providing irrigation water, the reservoir is used for water-based recreation.

1. GENERAL LOCATION MAP

FIGURE 1









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## **STATISTICAL INFORMATION**

### **1. General**

a) Owner	Montana Department of Natural Resources and Conservation (DNRC)
b) Operator	Ruby Water Users Association
c) Location	Section 8, Township 7 South, Range 4 West (dam location)
d) Latitude	45° 14' 06"
Longitude	112° 06' 42"
e) County--State	Madison--Montana
f) Watershed location	Ruby River, Jefferson River Basin
g) Drainage area	595 square miles

### **2. Principal elevations**

(feet above mean sea level)

a) Minimum dam crest	5,409.2 feet
b) Normal full pool	5,392.0 feet
c) Flashboard crest	5,392.97 feet
d) Toe of dam	5,299.0 feet

### **3. Reservoir**

a) Length of maximum pool (approximate miles)	3.3 miles
b) Maximum reservoir level of record (May 13, 1984)	5,395.3 feet
c) Surface area at normal pool	970 acres

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#### 4. Storage

- |   |                  |
|---|------------------|
| a) Maximum storage<br>(elevation 5,409.2 feet)                | 56,355 acre-feet |
| b) Normal storage<br>(elevation 5,392.0 feet)                 | 36,633 acre-feet |
| c) Storage to top of flashboards<br>(elevation 5,392.97 feet) | 37,612 acre-feet |
| d) Maximum surcharge  | 19,722 acre-feet |

#### 5. Hydrology

- |  |                                    |
|--|------------------------------------|
| a) Probable maximum flood (PMF)  | 117,200 cfs (470,400<br>acre-feet) |
| b) 100-year return period flood  | 3,920 cfs                          |
| c) 500-year return period flood  | 4,725 cfs                          |
| d) Maximum flow of record<br>(1938-1992) at USGS gage<br>06019500, just upstream<br>from reservoir | 3,810 cfs                          |

#### 6. Embankment (Dam)

- |   |            |
|---|------------|
| a) Type                                 | Earthfill  |
| b) Hydraulic height                     | 111 feet   |
| c) Crest length                         | 846 feet   |
| d) Crest width                          | 25 feet    |
| e) Downstream slope                     | 1v on 2.0h |
| f) Upstream slope<br>(above 5,392 feet) | 1v on 2.0h |
- 
-

- 
- |   |            |
|---|------------|
| g) Upstream slope<br>(below 5,392 feet) | 1v on 3.0h |
|---|------------|

**7. Outlet Works**

- |   |   |
|---|---|
| a) Size                                 | 90-inch concrete straight-legged horseshoe  |
| b) Length                               | 635 feet  |
| c) Control                              | 72-inch diameter slide gate upstream from a 72-inch butterfly valve--both valves are operated from the top of a 96-inch diameter concrete tower |
| d) Capacity (at elevation 5,409.2 feet) | 1,750 cfs   |
| e) Invert elevation                     | 5,298 feet  |
| f) Trashrack                            | Yes   |

**8. Spillway**

- |  |  |
|--|--|
| a) Location  | Right abutment   |
| b) Type  | Uncontrolled ogee (under normal operation a nominal 1-foot flash board is placed across the crest of the ogee) |
| c) Width   | 125 feet   |
| d) Length  | 361 feet   |
| e) Capacity (at elevation 5,409.2 feet--without flashboards) | 36,000 cfs   |
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## **OPERATING PROCEDURES**

The association operates Ruby Reservoir to provide an adequate supply of irrigation water to meet contracts with water users without exceeding safe storage or flow levels.

### **Method and Schedule of Operation**

The association's goal is to have the reservoir full before contract holders start putting in calls for water. The reservoir fills almost every year. The date that irrigation releases begin varies from year to year, with late-April typically the earliest. Irrigation releases from the reservoir usually end by October 1. The actual dates that releases begin and end depend on a year's climatological and hydrological conditions.

The Ruby River Reservoir Task Force has issued a Draft Report dated May 17, 1995 which spells out goals for the operation of the project to minimize dewatering of the reservoir and the river below the dam. The guidelines for the operation of Ruby River Reservoir developed by the task force are shown in Appendix C.

The maximum reservoir elevation for winter storage is 5,371 feet with 19,294 acre-feet of storage. This winter maximum helps prevent damage to the riprap and embankment from wind-driven waves and ice. The minimum reservoir pool is 2,600 acre-feet of storage. This currently corresponds to an elevation of 5,330.27 feet. This minimum level helps protect the fishery in the reservoir, help prevent sediment from being

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washed downstream, and helps during the winter to prevent ice damage to the inlet structure for the outlet works.

### **Safe Drawdown**

Because the stability of Ruby Dam has not been thoroughly investigated, DNRC recommends that drawdown rates not exceed one foot per day.

### **Limitations of Appurtenances**

Appurtenances to the Ruby Dam include the supply and delivery canals, the outlet works, and the spillway. The maximum capacity of the outlet works is 1,750 cfs at the minimum dam crest. The flow through the outlet works should be limited to a maximum of 600 cfs for short duration flows, and 450 cfs for long duration flows. These flows are to minimize damage to the outlet stilling basin. In addition, the spillway will discharge 36,000 cfs with the reservoir water elevation at the dam crest, without the flashboards in place. The spillway capacity with the flashboards in place is 32,400 cfs. The spillway rating table is shown in Appendix A.

### **Dam Operator**

The responsibility for the daily operation of the dam and reservoir rests with the association and its dam operator. The dam operator is generally authorized to operate the reservoir to meet the association's goal of providing adequate water to satisfy water purchase contracts without exceeding safe storage or flow levels. The dam operator's specific responsibilities are to:

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1. *Operate the mechanical features of the outlet works*
  2. *Coordinate filling the reservoir and releasing water*
  3. *Notify the State Water Projects Bureau (SWPB) of unusual occurrences such as impending floods or excessive seepage*
  4. *Perform various maintenance tasks*
  5. *Monitor weather conditions*
  6. *Monitor seepage*

Typically, the out-going dam operator, the water users association and the SWPB train a new dam operator. The dam operator's training focuses on the mechanical operation of the gates, measurement of the storage level, measurement of the rate of water release; and record keeping. The outlet gates are operated by a portable electric pipe-threading tool, fitted with an adapter to fit the gate's operating shaft. If necessary, the gates can be operated manually with a hand crank. The outlet works are intended to be used for controlling the release of irrigation water and not for providing emergency relief.

The dam operator is normally available daily to observe the dam and perform operating functions during the filling and irrigation seasons. At other times of the year the operator is available weekly or monthly. The dam operator lives downstream of the reservoir, within sight of the dam. Any changes to the dam crest, faces of the dam, or the outlet structure will be visible to the dam operator. Communication between the dam operator, the association, and the SWPB usually takes place by telephone. Although not typically available, radio communication may be

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established during emergencies or unusual occurrences, so that the dam operator can speak directly with county authorities and communicate indirectly with the SWPB (see *Ruby Dam Emergency Action Plan*).

### **Weather Monitoring**

The dam operator monitors weather conditions through local weather forecasts and the National Weather Service.

### **Interaction With Other Dams**

Except for irrigation diversion dams, Toston Dam and Canyon Ferry Dam are the next dams downstream from Ruby Dam. The safety of these dams is not affected by the normal operation of Ruby Dam. Therefore, interaction with other dams is not a concern of the normal operation of Ruby Reservoir. If it appears that Ruby Dam will breach, the dam operator should notify the operators at Toston Dam (406-266-3869) and Canyon Ferry Dam (406-475-3310).

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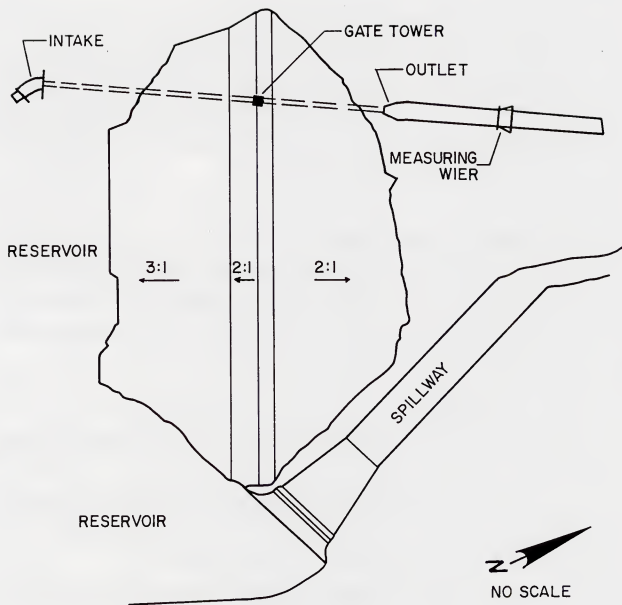
## **INSPECTION AND MONITORING**

The SWPB will inspect the dam annually. Appendix B includes an example of a SWPB inspection checklist. In addition to annual inspections, SWPB personnel will inspect the dam and reservoir during and after heavy runoff, severe rainstorms, and severe windstorms; during high storage periods; and after an earthquake. The embankment is not monitored by instrumentation.

### **Structural Features Inspection**

Structural features include the gatehouse, outlet works, and spillway. (Figure 3) The SWPB will inspect these structures annually as part of its inspection program. Items checked or noted include, but are not limited to:

1. *Outlet Works*
    - a) Any differential settlement or movement resulting in cracking of the conduit
    - b) Erosion of the seals or concrete by cavitation immediately downstream of the gates
    - c) Major seepage of water into the conduit
    - d) Major deterioration of exposed concrete due to freeze/thaw cycles or sulfate reactions
    - e) Operation of both gates through a full cycle
    - f) Air vent for free, unobstructed operation
    - g) Corrosion of any metal
    - h) Proper lubrication of the gate pedestals
-



**FIGURE 3**  
**3. GENERAL LAYOUT**

- 
- 
2. *Gate Tower* -- any damage or vandalism
  3. *Spillway*
    - a) Deterioration of concrete
    - b) Separation or movement of joints
    - c) Erosion of the spillway chute, backfill behind the walls, or stilling basin
    - d) Blockage of the approach or exit channel
  3. *Embankments*
    - a) Erosion gullies in dam and dike faces.
    - b) Damage from burrowing animals or vegetation.
    - c) Displacement or loss of rip-rap protection.
    - d) Displacement of fill, sink holes, slumps etc.
    - e) Any seepage.

### **Riprap Inspection**

The riprap along the faces of the dam should be at least 30 inches thick. Immediately after the occurrence of high water, SWPB personnel will inspect the riprap and determine if additional riprap is necessary.

### **Seepage Monitoring**

There are no visible seepage areas downstream of the dam. There are two drains located in the spillway which flow when the reservoir pool is near the spillway crest. Also, the joints in the two lower right spillway floor slabs will seep water when the reservoir pool is near the spillway

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crest elevation. The weep holes in the spillway flipbucket appear to be flowing, but the rate cannot be determined because the water in the flipbucket submerges the drains. In 1993, the 6-inch diameter drain in the left wall of the outlet tunnel was flowing, but the quantity of the flow could not be determined. The drain is difficult to measure due to its location in the outlet tunnel floor. This drain was installed to drain a spring that was discovered during construction of the dam. All of the drains are flowing clear water. To date, no measuring devices have been installed on any of the drains.

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## **MAINTENANCE**

The association is responsible for the project's routine maintenance. During regular visits, the dam operator will identify and perform normal maintenance activities. During the annual inspections, the SWPB will identify items that need maintenance or repair. The association will be required to perform the maintenance items within the time periods specified by the SWPB. The SWPB will supervise major repairs.

### **Routine Maintenance**

As soon as a need is identified, the dam operator will perform any routine maintenance necessary to protect the dam or keep it in good working order. The dam operator will watch for any potential maintenance requirements during normal visits to the dam. Items that may occasionally need attention include, but are not limited to:

1. *Lubrication of gate-operating mechanisms.*
2. *Debris or silt restricting the spillway inlet or the outlet works.* Accumulated debris that could affect the operation of these appurtenances will be removed at once, with all debris removed at least annually.
3. *Erosion gullies on embankment.* Development of erosion gullies will be checked immediately. Gullies will be filled, compacted, and seeded. Particular attention will be paid to the abutment contact areas and the downstream faces where four-wheel-drive tracks may become a problem.

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4. *Rodent damage.* Rodent burrows will be filled immediately and the rodents removed or destroyed.
  5. *Upstream slope riprap.* Reservoir riprap normally will be maintained annually, but may occasionally need repairs because of high water or wave action.
  6. *Vegetative cover on downstream slopes.* Good vegetative cover will be maintained, but large brush will be removed.

### **Annual Maintenance**

The SWPB will conduct annual inspections of Ruby Dam and Reservoir. During these inspections, any items that require maintenance will be identified and recorded. Items needing annual maintenance include the spillway, outlet works, gates, riprap, roads, and gatehouse. Any other routine items needing immediate attention also will be noted including the need to remove trees or brush.

After the association receives the SWPB inspection report, it will develop a maintenance schedule for any identified items. While the dam operator or association members may perform these routine tasks, major repairs are more likely to be performed by a contractor. The SWPB will assist in contracting for repairs and may supervise the repair work.

### **Record Keeping**

The SWPB will maintain records--including photographs--of all inspections and maintenance requirements. These records will also include flow measurements and storage volumes. Anyone who wants to

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review these records may do so in the SWPB's office at the Department of Natural Resources and Conservation in Helena.

The dam operator will keep records of the reservoir elevation, seepage observations or measurements, and any unusual conditions. These records may be reviewed at the dam operator's house.



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## REFERENCES

- CH2M Hill. April 1980. *Phase 1 Inspection Report, National Dam Safety Program, Ruby Dam, Alder Montana, Madison County, MT-4*. Prepared for the State of Montana (DNRC) under the U.S. Army Corps of Engineers' National Dam Safety Program.
- Omang, R. J. July 1992. *Analysis of the Magnitude and Frequency of Floods and the Peak-Flow Gaging Network in Montana*. Water Resources Investigations Report 92-4048. Helena, Montana: U.S. Geological Survey
- Shields, R. R., J. R. Knapton, M. K. White, T. M. Brosten, and C. L. Chambers. 1993. *Water Resources Data, Montana, Water Year 1992*. Water Data Report MT-92-1. Helena, Montana: U.S. Geological Survey
- Todd, Neil, Ruby Dam operator. April 1993 and November 1993. Personal meeting and telephone communications with Jim Beck, Water Resources Division, Helena Regional Office Civil Engineering Specialist, DNRC, Helena.



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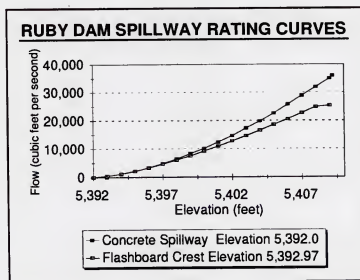
**APPENDIX A**

**RATING CURVES AND TABLES**



**TABLE A-1****RUBY DAM SPILLWAY RATING TABLE**

<b>ELEVATION</b> (feet)	<b>CONCRETE SPILLWAY CREST</b> (cfs)	<b>FLASHBOARD CREST</b> (cfs)
5,392.00	0	
5,392.97	478	0
5,393.00	500	2
5,394.00	1,150	435
5,395.00	2,100	1,204
5,396.00	3,400	2,184
5,397.00	4,800	3,333
5,398.00	6,400	4,627
5,399.00	8,400	6,041
5,400.00	10,100	7,563
5,401.00	12,400	9,196
5,402.00	14,600	10,908
5,403.00	17,300	12,698
5,404.00	19,800	14,575
5,405.00	22,600	16,508
5,406.00	25,800	18,520
5,407.00	28,900	20,581
5,408.00	31,900	22,696
5,409.00	35,000	24,870
5,409.20	36,000	25,337

**FIGURE A-1**

**TABLE A-2****RUBY RIVER RESERVOIR  
LIVE STORAGE TABLE**

<b>SLOPE DISTANCE</b>	<b>ELEVATION [Feet]</b>	<b>CONTENTS [Acre-feet]</b>	<b>SLOPE DISTANCE</b>	<b>ELEVATION [Feet]</b>	<b>CONTENTS [Acre-feet]</b>	
0+00	5,395.87	40,610				
0+00	95.07	39,738				
+01	94.80	39,460	{ Top of Pin #1	+37	90.71	35,388
+02	94.36	39,015		+38	90.56	35,243
+03	94.31	38,965	+39	90.44	35,127	
+04	94.22	38,874	0+40	5,390.33	35,021	
+05	93.96	38,611	+41	90.21	34,905	
+06	93.88	38,531	+42	90.10	34,809	
+07	93.68	38,329	+43	89.98	34,684	
+08	93.56	38,208	+44	89.97	34,675	
+09	93.46	38,107	+45	89.80	34,519	
0+10	5,393.33	37,975	+46	89.70	34,427	
+11	93.24	37,885	+47	89.68	34,409	
+12	93.13	37,773	+48	89.54	34,281	
+13	93.01	37,652	+49	89.46	34,207	
+13.8	92.97	37,612	0+50	5,390.20	34,896	{ Top of Pin #2
+14	92.83	37,471	0+50	89.21	33,978	
+15	92.74	37,380	{ Top of Boards	+51	89.26	34,024
+16	92.65	37,289		+52	89.20	33,969
+17	92.56	37,198	+53	89.10	33,877	
+18	92.45	37,087	+54	89.02	33,804	
+19	92.32	36,956	+55	88.96	33,749	
0+20	5,392.25	36,885	+56	88.93	33,721	
+21	92.15	36,784	+57	88.84	33,639	
+22	92.00	36,633	+58	88.79	33,593	
+23	91.94	36,575	+59	88.72	33,529	
+24	91.84	36,478	{ Concrete Spillway Crest	0+60	5,388.62	33,437
+25	91.64	36,285		+61	88.56	33,382
+26	91.52	36,169	+62	88.51	33,336	
+27	91.43	36,082	+63	88.44	33,272	
+28	91.34	35,996	+64	88.34	33,180	
+29	91.24	35,899	+65	88.26	33,107	
0+30	5,391.12	35,783	+66	88.19	33,043	
+31	90.02	35,687	+67	88.11	32,969	
+32	90.90	35,571	+68	88.05	32,914	
+33	90.85	35,523	+69	87.96	32,832	
+34	90.80	35,475	0+70	5,387.93	32,804	
+35	90.80	35,475	+71	87.86	32,740	
+36	90.76	35,426	+72	87.82	32,703	
+75	87.62	32,520	+73	87.80	32,685	
+76	87.56	32,465	+74	87.70	32,593	



**TABLE A-2 continued**

<b>SLOPE DISTANCE</b>	<b>ELEVATION (Feet)</b>	<b>CONTENTS (Acre-feet)</b>	<b>SLOPE DISTANCE</b>	<b>ELEVATION (Feet)</b>	<b>CONTENTS (Acre-feet)</b>
+77	87.49	32,401	+18	82.96	28,370
+78	87.43	32,346	+19	82.86	28,276
+79	87.38	32,333	1+20	5,382.72	28,165
0+80	5,387.30	32,227	+21	82.62	28,079
0+81	5,387.13	32,071	+22	82.41	27,899
+82	87.04	31,988	+23	82.33	27,830
+83	86.95	31,906	+24	82.19	27,711
+84	86.78	31,750	+25	82.03	27,573
+85	86.70	31,676	+26	81.87	27,436
+86	86.69	31,667	+27	81.71	27,299
+87	86.58	31,566	+28	81.59	27,197
+88	86.45	31,447	+29	81.49	27,111
+89	86.43	31,429	1+30	5,381.38	27,017
0+90	5,386.32	31,328	+31	81.25	26,905
+91	86.04	31,071	+32	81.06	26,743
+92	85.92	30,961	+33	80.96	26,657
+93	85.79	30,842	+34	80.83	26,546
+94	85.68	30,741	+35	80.70	26,434
+95	85.41	30,494	+36	80.31	26,100
+96	85.31	30,402	+37	80.13	25,846
+97	85.23	30,328	+38	80.04	25,869
+98	85.14	30,246	+39	79.89	25,750
+99	85.04	30,154	1+40	5,379.68	25,587
1+00	85.61	30,677	+41	79.58	25,510
1+00	84.59	29,766	+42	79.22	25,232
+01	84.83	29,972	+43	79.04	25,092
+02	84.82	29,963	+44	78.91	24,992
+03	84.70	29,861	+45	78.61	24,760
+04	84.63	29,801	+46	78.26	24,490
+05	84.54	29,724	+47	77.90	24,211
+06	84.41	29,612	+48	77.71	24,064
+07	84.35	29,561	+49	77.36	23,794
+08	84.20	29,432	1+50	5,377.72	24,072
+09	84.13	29,372	1+50	76.70	23,284
1+10	5,384.06	29,312	+51	76.78	23,345
+11	83.97	29,235	+52	76.44	23,083
+12	83.85	29,132	+53	76.16	22,866
+13	83.75	29,047	+54	75.88	22,650
+14	83.52	28,850	+55	75.33	22,225
+15	83.31	28,670	+56	75.00	21,970
+16	83.20	28,576	+57	74.54	21,662
+17	83.11	28,499	+58	74.19	21,428

**TABLE A-2 continued**

<b>SLOPE DISTANCE</b>	<b>ELEVATION (Feet)</b>	<b>CONTENTS (Acre-feet)</b>	<b>SLOPE DISTANCE</b>	<b>ELEVATION (Feet)</b>	<b>CONTENTS (Acre-feet)</b>
1+59	5,374.00	21,301	2+00	63.15	14,717
1+60	5,373.81	21,173	+01	63.24	14,764
+61	73.68	21,086	+02	62.96	14,618
+62	73.12	20,712	+03	62.56	14,408
+63	72.98	20,618	+04	62.32	14,282
+64	72.83	20,518	+05	62.16	14,198
+65	72.46	20,270	+06	62.06	14,146
+66	72.22	20,110	+07	61.72	13,968
+67	71.81	19,835	+08	61.46	13,832
+68	71.64	19,722	+09	61.23	13,711
+69	71.41	19,568	2+10	5,361.01	13,596
1+70	5,370.91	19,233	+11	60.89	13,533
+71	70.64	19,053	+12	60.64	13,402
+72	70.51	18,966	+13	60.52	13,339
+73	70.21	18,765	+14	60.40	13,276
+74	69.96	18,601	+15	60.20	13,171
+75	69.80	18,507	+16	60.04	13,088
+76	69.69	18,442	+17	59.80	12,974
+77	69.43	18,290	+18	59.62	12,891
+78	69.15	18,125	+19	59.49	12,831
+79	68.84	17,943	2+20	5,359.34	12,762
1+80	5,368.28	17,614	+21	59.21	12,702
+81	68.06	17,485	+22	58.81	12,517
+82	67.26	17,015	+23	58.56	12,402
+83	67.12	16,932	+24	58.21	12,240
+84	67.03	16,879	+25	57.74	12,023
+85	66.91	16,809	+26	57.61	11,963
+86	66.74	16,709	+27	57.21	11,779
+87	66.39	16,503	+28	56.71	11,548
+88	66.14	16,356	+29	56.49	11,446
+89	65.69	16,092	2+30	5,356.18	11,303
1+90	5,365.45	15,951	+31	55.85	11,151
+91	65.29	15,857	+32	55.46	11,017
+92	65.04	15,710	+33	55.30	10,897
+93	64.91	15,639	+34	55.15	10,828
+94	64.66	15,508	+35	55.01	10,763
+95	64.51	15,430	+36	54.84	10,693
+96	64.35	15,346	+37	54.70	10,636
+97	64.06	15,194	+38	54.65	10,615
+98	63.79	15,053	+39	54.55	10,574
+99	63.62	14,963	2+40	5,354.50	10,554
2+00	5,363.91	15,115	+41	54.41	10,517

Top of  
Pin #5

**TABLE A-2 continued**

<b>SLOPE DISTANCE</b>	<b>ELEVATION (Feet)</b>	<b>CONTENTS (Acre-feet)</b>	<b>SLOPE DISTANCE</b>	<b>ELEVATION (Feet)</b>	<b>CONTENTS (Acre-feet)</b>
+42	54.36	10,496	+83	43.00	6,222
+43	54.31	10,476	+84	42.47	6,048
+44	54.26	10,455	+85	42.18	5,953
+45	54.19	10,426	+86	41.92	5,868
+46	54.14	10,406	+87	41.51	5,734
+47	54.09	10,385	+88	41.24	5,646
+48	54.07	10,377	+89	40.85	5,518
+49	54.02	10,357	2+90	5,340.49	5,401
2+50	5,353.86	10,291	+91	40.30	5,339
+51	53.83	10,279	+92	39.99	5,238
+52	53.77	10,254	+93	39.73	5,162
+53	53.74	10,242	+94	39.48	5,090
+54	53.67	10,209	+95	39.23	5,018
+55	54.51	10,558	+96	38.88	4,916
+55	53.53	10,156	+96.5	38.78	4,880
+56	53.41	10,107	+97	38.68	4,858
+57	53.23	10,033	+98	38.53	4,815
+58	53.05	9,959	+99	38.43	4,786
+59	52.71	9,820	3+00	5,338.17	4,711
2+60	5,352.48	9,725	+01	37.95	4,647
+61	52.11	9,574	+02	37.85	4,618
+62	51.64	9,381	+03	37.69	4,572
+63	51.15	9,180	+04	37.54	4,528
+64	50.80	9,037	+05	37.38	4,482
+65	50.36	8,856	0+00	5,338.78	4,887
+66	49.95	8,690	+01	38.23	4,728
+67	49.44	8,503	+02	38.07	4,682
+68	48.94	8,320	+03	37.86	4,621
+69	48.58	8,188	+04	37.69	4,572
2+70	5,348.20	8,049	+05	37.41	4,490
+71	47.87	7,928	+06	37.18	4,424
+72	47.61	7,832	+07	37.06	4,389
+73	47.37	7,744	+08	36.95	4,357
+74	47.03	7,620	+09	36.63	4,265
+75	46.51	7,429	0+10	5,336.33	4,178
+76	46.25	7,334	+11	35.83	4,033
+77	46.01	7,246	+12	35.59	3,963
+78	45.77	7,158	+13	35.46	3,926
+79	45.43	7,033	+14	34.94	3,777
2+80	5,344.78	6,804	+15	34.73	3,725
+81	44.65	6,761	+16	34.59	3,689
+82	44.55	6,728	+17	34.45	3,654

**TABLE A-2 continued**

<b>SLOPE DISTANCE</b>	<b>ELEVATION (Feet)</b>	<b>CONTENTS (Acre-feet)</b>	<b>SLOPE DISTANCE</b>	<b>ELEVATION (Feet)</b>	<b>CONTENTS (Acre-feet)</b>
+18	34.32	3,621	+59	25.61	1,645
+19	34.14	3,576	0+60	5,325.48	1,619
0+20	5,333.97	3,533	+61	25.42	1,607
+21	33.81	3,493	+62	25.42	1,607
+22	33.48	3,410	+63	25.22	1,566
+23	33.18	3,335	+64	24.72	1,480
+24	32.86	3,254	+65	24.58	1,459
+25	32.53	3,169	+66	24.48	1,444
+26	32.14	3,073	+67	24.43	1,437
+27	31.95	3,025	+68	24.31	1,419
+28	31.73	2,970	+69	24.25	1,410
+29	31.50	2,912	0+70	5,324.19	1,401
0+30	5,331.28	2,857	+71	24.08	1,385
+31	31.06	2,801	+72	23.91	1,360
+32	30.83	2,743	+73	23.81	1,345
+33	30.68	2,706	+74	23.70	1,328
+34	30.54	2,670	+75	23.56	1,308
+35	30.34	2,620	+76	23.27	1,264
+36	30.11	2,562	+77	23.16	1,248
+37	29.80	2,494	+78	23.07	1,235
+38	29.52	2,437	+79	22.88	1,207
+39	29.35	2,403	0+80	5,322.72	1,183
0+40	5,329.22	2,377	+81	22.59	1,163
+41	29.04	2,340	+82	22.35	1,128
+42	28.81	2,293	+83	22.10	1,091
+43	28.56	2,243	+84	21.81	1,048
+44	28.14	2,158	+85	21.60	1,016
+45	5,327.95	2,119	+86	21.44	993
+46	27.72	2,073	+87	21.34	978
+47	27.42	2,012			
+48	27.23	1,973			
+49	27.09	1,945			
0+50	5,327.12	1,951			
+05	37.41	4,490			
+51	26.78	1,882			
+52	26.66	1,858			
+53	26.46	1,817			
+54	26.03	1,730			
+55	25.96	1,716			
+56	25.84	1,692			
+57	25.75	1,673			
+58	25.66	1,655			

*Storage volumes revised 3/30/1995  
based upon new area capacity table and  
topographic maps completed in 1994.*

{ Top of  
Block B

TABLE A-3  
RUBY DAM STORAGE - ELEVATION TABLE

GH	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
5300.0	0	0	0	0	0	0	0	0	0	0
5300.1	0	0	0	0	0	0	0	0	0	0
5300.2	0	0	0	0	0	0	0	0	0	0
5300.3	0	0	0	0	0	0	0	0	0	0
5300.4	0	0	0	0	0	0	0	0	0	0
5300.5	0	0	0	0	0	0	0	0	0	0
5300.6	0	0	0	0	0	0	0	0	0	0
5300.7	0	0	0	0	0	0	0	0	0	0
5300.8	0	0	0	0	0	0	0	0	0	0
5300.9	0	0	0	0	0	0	0	0	0	0
5301.0	0	0	0	0	0	0	0	0	0	0
5301.1	0	0	0	0	0	0	0	0	0	0
5301.2	0	0	0	0	0	0	0	0	0	0
5301.3	0	0	0	0	0	0	0	0	0	0
5301.4	0	0	0	0	0	0	0	0	0	0
5301.5	0	0	0	0	0	0	0	0	0	1
5301.6	1	1	1	1	1	1	1	1	1	1
5301.7	1	1	1	1	1	1	1	1	1	1
5301.8	1	1	1	1	1	1	1	1	1	1
5301.9	1	1	1	1	1	1	1	1	1	1
5302.0	1	1	1	1	1	1	1	1	1	1
5302.1	1	1	1	1	1	1	1	1	1	1
5302.2	1	1	1	1	1	1	1	1	1	1
5302.3	1	1	1	1	1	1	1	1	1	1
5302.4	1	1	1	1	1	1	1	1	1	1
5302.5	1	1	1	1	1	1	1	1	1	1
5302.6	1	1	1	1	1	1	1	1	1	1
5302.7	1	1	1	1	1	1	1	1	1	1
5302.8	1	1	1	1	1	1	1	1	1	1
5302.9	1	1	1	1	1	1	1	1	1	1
5303.0	1	1	1	1	1	1	1	1	1	1
5303.1	1	1	1	1	1	1	1	1	1	1
5303.2	1	1	1	1	1	2	2	2	2	2
5303.3	2	2	2	2	2	2	2	2	2	2
5303.4	2	2	2	2	2	2	2	2	2	2
5303.5	2	2	2	2	2	2	2	2	2	2
5303.6	2	2	2	2	2	2	2	2	2	2
5303.7	2	2	2	2	2	2	2	2	2	2
5303.8	2	2	2	2	2	2	2	2	2	2
5303.9	2	2	2	2	2	2	2	2	2	2
5304.0	2	2	2	2	2	2	2	2	2	2
5304.1	2	2	2	2	2	2	2	2	2	2
5304.2	2	2	2	2	2	2	2	2	2	2
5304.3	2	2	2	2	2	2	2	2	2	2
5304.4	2	2	2	2	2	2	2	2	2	2
5304.5	2	2	2	2	2	2	2	2	2	2
5304.6	2	2	2	2	2	2	2	2	2	2
5304.7	2	2	2	2	2	2	2	2	2	2
5304.8	2	2	2	2	2	2	2	2	2	2
5304.9	2	2	3	3	3	3	3	3	3	3

TABLE A-3 continued  
RUBY DAM STORAGE - ELEVATION TABLE

GH	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
5305.0	3	3	3	3	3	3	3	3	3	4
5305.1	4	4	4	4	4	4	4	4	4	5
5305.2	5	5	5	5	5	5	5	5	6	6
5305.3	6	6	6	6	6	6	6	6	7	7
5305.4	7	7	7	7	7	7	7	8	8	8
5305.5	8	8	8	8	8	8	8	9	9	9
5305.6	9	9	9	9	9	9	10	10	10	10
5305.7	10	10	10	10	10	10	11	11	11	11
5305.8	11	11	11	11	11	12	12	12	12	12
5305.9	12	12	12	12	13	13	13	13	13	13
5306.0	13	13	13	13	14	14	14	14	14	14
5306.1	14	14	14	15	15	15	15	15	15	15
5306.2	15	15	15	16	16	16	16	16	16	16
5306.3	16	16	17	17	17	17	17	17	17	17
5306.4	17	17	18	18	18	18	18	18	18	18
5306.5	18	19	19	19	19	19	19	19	19	19
5306.6	20	20	20	20	20	20	20	20	20	20
5306.7	21	21	21	21	21	21	21	21	21	22
5306.8	22	22	22	22	22	22	22	22	22	23
5306.9	23	23	23	23	23	23	23	23	24	24
5307.0	24	24	24	24	24	24	24	24	25	25
5307.1	25	25	25	25	25	25	25	26	26	26
5307.2	26	26	26	26	26	26	27	27	27	27
5307.3	27	27	27	27	27	27	28	28	28	28
5307.4	28	28	28	28	28	29	29	29	29	29
5307.5	29	29	29	29	29	30	30	30	30	30
5307.6	30	30	30	30	31	31	31	31	31	31
5307.7	31	31	31	31	32	32	32	32	32	32
5307.8	32	32	32	33	33	33	33	33	33	33
5307.9	33	33	34	34	34	34	34	34	34	34
5308.0	34	34	35	35	35	35	35	35	35	35
5308.1	35	36	36	36	36	36	36	36	36	36
5308.2	36	37	37	37	37	37	37	37	37	37
5308.3	38	38	38	38	38	38	38	38	38	38
5308.4	39	39	39	39	39	39	39	39	39	40
5308.5	40	40	40	40	40	40	40	40	40	41
5308.6	41	41	41	41	41	41	41	41	42	42
5308.7	42	42	42	42	42	42	42	43	43	43
5308.8	43	43	43	43	43	43	43	44	44	44
5308.9	44	44	44	44	44	44	45	45	45	45
5309.0	45	45	45	45	45	45	46	46	46	46
5309.1	46	46	46	46	46	47	47	47	47	47
5309.2	47	47	47	47	47	48	48	48	48	48
5309.3	48	48	48	48	49	49	49	49	49	49
5309.4	49	49	49	50	50	50	50	50	50	50
5309.5	50	50	50	51	51	51	51	51	51	51
5309.6	51	51	52	52	52	52	52	52	52	52
5309.7	52	52	53	53	53	53	53	53	53	53
5309.8	53	54	54	54	54	54	54	54	54	54
5309.9	54	55	55	55	55	55	55	55	55	55

TABLE A-3 continued  
RUBY DAM STORAGE - ELEVATION TABLE

GH	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
5315.0	286	287	288	289	289	290	291	292	293	294
5315.1	295	296	297	298	299	300	301	302	303	304
5315.2	305	306	307	308	309	310	311	312	313	314
5315.3	315	316	317	318	319	320	321	322	323	324
5315.4	325	326	327	328	329	330	331	332	333	334
5315.5	335	336	337	338	339	340	341	342	343	344
5315.6	345	346	347	348	349	350	351	352	353	354
5315.7	355	356	357	358	359	359	360	361	362	363
5315.8	364	365	366	367	368	369	370	371	372	373
5315.9	374	375	376	377	378	379	380	381	382	383
5316.0	384	385	386	387	388	389	390	391	392	393
5316.1	394	395	396	397	398	399	400	401	402	403
5316.2	404	405	406	407	408	409	410	411	412	413
5316.3	414	415	416	417	418	419	420	421	422	423
5316.4	424	425	426	427	428	429	430	430	431	432
5316.5	433	434	435	436	437	438	439	440	441	442
5316.6	443	444	445	446	447	448	449	450	451	452
5316.7	453	454	455	456	457	458	459	460	461	462
5316.8	463	464	465	466	467	468	469	470	471	472
5316.9	473	474	475	476	477	478	479	480	481	482
5317.0	483	484	485	486	487	488	489	490	491	492
5317.1	493	494	495	496	497	498	499	500	500	501
5317.2	502	503	504	505	506	507	508	509	510	511
5317.3	512	513	514	515	516	517	518	519	520	521
5317.4	522	523	524	525	526	527	528	529	530	531
5317.5	532	533	534	535	536	537	538	539	540	541
5317.6	542	543	544	545	546	547	548	549	550	551
5317.7	552	553	554	555	556	557	558	559	560	561
5317.8	562	563	564	565	566	567	568	569	570	571
5317.9	571	572	573	574	575	576	577	578	579	580
5318.0	581	582	583	584	585	586	587	588	589	590
5318.1	591	592	593	594	595	596	597	598	599	600
5318.2	601	602	603	604	605	606	607	608	609	610
5318.3	611	612	613	614	615	616	617	618	619	620
5318.4	621	622	623	624	625	626	627	628	629	630
5318.5	631	632	633	634	635	636	637	638	639	640
5318.6	641	641	642	643	644	645	646	647	648	649
5318.7	650	651	652	653	654	655	656	657	658	659
5318.8	660	661	662	663	664	665	666	667	668	669
5318.9	670	671	672	673	674	675	676	677	678	679
5319.0	680	681	682	683	684	685	686	687	688	689
5319.1	690	691	692	693	694	695	696	697	698	699
5319.2	700	701	702	703	704	705	706	707	708	709
5319.3	710	711	712	712	713	714	715	716	717	718
5319.4	719	720	721	722	723	724	725	726	727	728
5319.5	729	730	731	732	733	734	735	736	737	738
5319.6	739	740	741	742	743	744	745	746	747	748
5319.7	749	750	751	752	753	754	755	756	757	758
5319.8	759	760	761	762	763	764	765	766	767	768
5319.9	769	770	771	772	773	774	775	776	777	778

TABLE A-3 continued  
RUBY DAM STORAGE - ELEVATION TABLE

GH	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
5320.0	779	780	782	783	784	786	787	789	790	792
5320.1	793	795	796	798	799	801	802	804	805	807
5320.2	808	810	811	813	814	816	817	819	820	822
5320.3	823	825	826	828	829	831	832	834	835	837
5320.4	838	839	841	842	844	845	847	848	850	851
5320.5	853	854	856	857	859	860	862	863	865	866
5320.6	868	869	871	872	874	875	877	878	880	881
5320.7	883	884	886	887	889	890	891	893	894	896
5320.8	897	899	900	902	903	905	906	908	909	911
5320.9	912	914	915	917	918	920	921	923	924	926
5321.0	927	929	930	932	933	935	936	938	939	941
5321.1	942	943	945	946	948	949	951	952	954	955
5321.2	957	958	960	961	963	964	966	967	969	970
5321.3	972	973	975	976	978	979	981	982	984	985
5321.4	987	988	990	991	993	994	996	997	998	1000
5321.5	1001	1003	1004	1006	1007	1009	1010	1012	1013	1015
5321.6	1016	1018	1019	1021	1022	1024	1025	1027	1028	1030
5321.7	1031	1033	1034	1036	1037	1039	1040	1042	1043	1045
5321.8	1046	1048	1049	1050	1052	1053	1055	1056	1058	1059
5321.9	1061	1062	1064	1065	1067	1068	1070	1071	1073	1074
5322.0	1076	1077	1079	1080	1082	1083	1085	1086	1088	1089
5322.1	1091	1092	1094	1095	1097	1098	1100	1101	1102	1104
5322.2	1105	1107	1108	1110	1111	1113	1114	1116	1117	1119
5322.3	1120	1122	1123	1125	1126	1128	1129	1131	1132	1134
5322.4	1135	1137	1138	1140	1141	1143	1144	1146	1147	1149
5322.5	1150	1152	1153	1155	1156	1157	1159	1160	1162	1163
5322.6	1165	1166	1168	1169	1171	1172	1174	1175	1177	1178
5322.7	1180	1181	1183	1184	1186	1187	1189	1190	1192	1193
5322.8	1195	1196	1198	1199	1201	1202	1204	1205	1207	1208
5322.9	1209	1211	1212	1214	1215	1217	1218	1220	1221	1223
5323.0	1224	1226	1227	1229	1230	1232	1233	1235	1236	1238
5323.1	1239	1241	1242	1244	1245	1247	1248	1250	1251	1253
5323.2	1254	1256	1257	1259	1260	1261	1263	1264	1266	1267
5323.3	1269	1270	1272	1273	1275	1276	1278	1279	1281	1282
5323.4	1284	1285	1287	1288	1290	1291	1293	1294	1296	1297
5323.5	1299	1300	1302	1303	1305	1306	1308	1309	1311	1312
5323.6	1314	1315	1316	1318	1319	1321	1322	1324	1325	1327
5323.7	1328	1330	1331	1333	1334	1336	1337	1339	1340	1342
5323.8	1343	1345	1346	1348	1349	1351	1352	1354	1355	1357
5323.9	1358	1360	1361	1363	1364	1366	1367	1368	1370	1371
5324.0	1373	1374	1376	1377	1379	1380	1382	1383	1385	1386
5324.1	1388	1389	1391	1392	1394	1395	1397	1398	1400	1401
5324.2	1403	1404	1406	1407	1409	1410	1412	1413	1415	1416
5324.3	1418	1419	1421	1422	1423	1425	1426	1428	1429	1431
5324.4	1432	1434	1435	1437	1438	1440	1441	1443	1444	1446
5324.5	1447	1449	1450	1452	1453	1455	1456	1458	1459	1461
5324.6	1462	1464	1465	1467	1468	1470	1471	1473	1474	1475
5324.7	1477	1478	1480	1481	1483	1484	1486	1487	1489	1490
5324.8	1492	1493	1495	1496	1498	1499	1501	1502	1504	1505
5324.9	1507	1508	1510	1511	1513	1514	1516	1517	1519	1520



TABLE A-3 continued  
RUBY DAM STORAGE - ELEVATION TABLE

GH	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
5325.0	1522	1524	1526	1528	1530	1532	1534	1536	1538	1540
5325.1	1542	1544	1546	1548	1550	1552	1554	1556	1558	1560
5325.2	1562	1564	1566	1568	1570	1572	1574	1576	1578	1580
5325.3	1582	1584	1586	1588	1590	1592	1594	1597	1599	1601
5325.4	1603	1605	1607	1609	1611	1613	1615	1617	1619	1621
5325.5	1623	1625	1627	1629	1631	1633	1635	1637	1639	1641
5325.6	1643	1645	1647	1649	1651	1653	1655	1657	1659	1661
5325.7	1663	1665	1667	1669	1671	1673	1676	1678	1680	1682
5325.8	1684	1686	1688	1690	1692	1694	1696	1698	1700	1702
5325.9	1704	1706	1708	1710	1712	1714	1716	1718	1720	1722
5326.0	1724	1726	1728	1730	1732	1734	1736	1738	1740	1742
5326.1	1744	1746	1748	1750	1753	1755	1757	1759	1761	1763
5326.2	1765	1767	1769	1771	1773	1775	1777	1779	1781	1783
5326.3	1785	1787	1789	1791	1793	1795	1797	1799	1801	1803
5326.4	1805	1807	1809	1811	1813	1815	1817	1819	1821	1823
5326.5	1825	1827	1830	1832	1834	1836	1838	1840	1842	1844
5326.6	1846	1848	1850	1852	1854	1856	1858	1860	1862	1864
5326.7	1866	1868	1870	1872	1874	1876	1878	1880	1882	1884
5326.8	1886	1888	1890	1892	1894	1896	1898	1900	1902	1904
5326.9	1906	1909	1911	1913	1915	1917	1919	1921	1923	1925
5327.0	1927	1929	1931	1933	1935	1937	1939	1941	1943	1945
5327.1	1947	1949	1951	1953	1955	1957	1959	1961	1963	1965
5327.2	1967	1969	1971	1973	1975	1977	1979	1981	1983	1986
5327.3	1988	1990	1992	1994	1996	1998	2000	2002	2004	2006
5327.4	2008	2010	2012	2014	2016	2018	2020	2022	2024	2026
5327.5	2028	2030	2032	2034	2036	2038	2040	2042	2044	2046
5327.6	2048	2050	2052	2054	2056	2058	2060	2062	2065	2067
5327.7	2069	2071	2073	2075	2077	2079	2081	2083	2085	2087
5327.8	2089	2091	2093	2095	2097	2099	2101	2103	2105	2107
5327.9	2109	2111	2113	2115	2117	2119	2121	2123	2125	2127
5328.0	2129	2131	2133	2135	2137	2139	2142	2144	2146	2148
5328.1	2150	2152	2154	2156	2158	2160	2162	2164	2166	2168
5328.2	2170	2172	2174	2176	2178	2180	2182	2184	2186	2188
5328.3	2190	2192	2194	2196	2198	2200	2202	2204	2206	2208
5328.4	2210	2212	2214	2216	2218	2221	2223	2225	2227	2229
5328.5	2231	2233	2235	2237	2239	2241	2243	2245	2247	2249
5328.6	2251	2253	2255	2257	2259	2261	2263	2265	2267	2269
5328.7	2271	2273	2275	2277	2279	2281	2283	2285	2287	2289
5328.8	2291	2293	2295	2298	2300	2302	2304	2306	2308	2310
5328.9	2312	2314	2316	2318	2320	2322	2324	2326	2328	2330
5329.0	2332	2334	2336	2338	2340	2342	2344	2346	2348	2350
5329.1	2352	2354	2356	2358	2360	2362	2364	2366	2368	2370
5329.2	2372	2374	2377	2379	2381	2383	2385	2387	2389	2391
5329.3	2393	2395	2397	2399	2401	2403	2405	2407	2409	2411
5329.4	2413	2415	2417	2419	2421	2423	2425	2427	2429	2431
5329.5	2433	2435	2437	2439	2441	2443	2445	2447	2449	2451
5329.6	2454	2456	2458	2460	2462	2464	2466	2468	2470	2472
5329.7	2474	2476	2478	2480	2482	2484	2486	2488	2490	2492
5329.8	2494	2496	2498	2500	2502	2504	2506	2508	2510	2512
5329.9	2514	2516	2518	2520	2522	2524	2526	2528	2530	2533

TABLE A-3 continued  
RUBY DAM STORAGE - ELEVATION TABLE

GH	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
5330.0	2535	2537	2540	2542	2545	2547	2550	2552	2555	2557
5330.1	2560	2562	2565	2567	2570	2572	2575	2577	2580	2582
5330.2	2585	2587	2590	2592	2595	2597	2600	2602	2605	2608
5330.3	2610	2613	2615	2618	2620	2623	2625	2628	2630	2633
5330.4	2635	2638	2640	2643	2645	2648	2650	2653	2655	2658
5330.5	2660	2663	2665	2668	2670	2673	2675	2678	2680	2683
5330.6	2686	2688	2691	2693	2696	2698	2701	2703	2706	2708
5330.7	2711	2713	2716	2718	2721	2723	2726	2728	2731	2733
5330.8	2736	2738	2741	2743	2746	2748	2751	2753	2756	2758
5330.9	2761	2764	2766	2769	2771	2774	2776	2779	2781	2784
5331.0	2786	2789	2791	2794	2796	2799	2801	2804	2806	2809
5331.1	2811	2814	2816	2819	2821	2824	2826	2829	2831	2834
5331.2	2836	2839	2842	2844	2847	2849	2852	2854	2857	2859
5331.3	2862	2864	2867	2869	2872	2874	2877	2879	2882	2884
5331.4	2887	2889	2892	2894	2897	2899	2902	2904	2907	2909
5331.5	2912	2914	2917	2919	2922	2925	2927	2930	2932	2935
5331.6	2937	2940	2942	2945	2947	2950	2952	2955	2957	2960
5331.7	2962	2965	2967	2970	2972	2975	2977	2980	2982	2985
5331.8	2987	2990	2992	2995	2997	3000	3003	3005	3008	3010
5331.9	3013	3015	3018	3020	3023	3025	3028	3030	3033	3035
5332.0	3038	3040	3043	3045	3048	3050	3053	3055	3058	3060
5332.1	3063	3065	3068	3070	3073	3075	3078	3081	3083	3086
5332.2	3088	3091	3093	3096	3098	3101	3103	3106	3108	3111
5332.3	3113	3116	3118	3121	3123	3126	3128	3131	3133	3136
5332.4	3138	3141	3143	3146	3148	3151	3153	3156	3159	3161
5332.5	3164	3166	3169	3171	3174	3176	3179	3181	3184	3186
5332.6	3189	3191	3194	3196	3199	3201	3204	3206	3209	3211
5332.7	3214	3216	3219	3221	3224	3226	3229	3231	3234	3237
5332.8	3239	3242	3244	3247	3249	3252	3254	3257	3259	3262
5332.9	3264	3267	3269	3272	3274	3277	3279	3282	3284	3287
5333.0	3289	3292	3294	3297	3299	3302	3304	3307	3309	3312
5333.1	3315	3317	3320	3322	3325	3327	3330	3332	3335	3337
5333.2	3340	3342	3345	3347	3350	3352	3355	3357	3360	3362
5333.3	3365	3367	3370	3372	3375	3377	3380	3382	3385	3387
5333.4	3390	3393	3395	3398	3400	3403	3405	3408	3410	3413
5333.5	3415	3418	3420	3423	3425	3428	3430	3433	3435	3438
5333.6	3440	3443	3445	3448	3450	3453	3455	3458	3460	3463
5333.7	3465	3468	3471	3473	3476	3478	3481	3483	3486	3488
5333.8	3491	3493	3496	3498	3501	3503	3506	3508	3511	3513
5333.9	3516	3518	3521	3523	3526	3528	3531	3533	3536	3538
5334.0	3541	3543	3546	3548	3551	3554	3556	3559	3561	3564
5334.1	3566	3569	3571	3574	3576	3579	3581	3584	3586	3589
5334.2	3591	3594	3596	3599	3601	3604	3606	3609	3611	3614
5334.3	3616	3619	3621	3624	3626	3629	3632	3634	3637	3639
5334.4	3642	3644	3647	3649	3652	3654	3657	3659	3662	3664
5334.5	3667	3669	3672	3674	3677	3679	3682	3684	3687	3689
5334.6	3692	3694	3697	3699	3702	3704	3707	3710	3712	3715
5334.7	3717	3720	3722	3725	3727	3730	3732	3735	3737	3740
5334.8	3742	3745	3747	3750	3752	3755	3757	3760	3762	3765
5334.9	3767	3770	3772	3775	3777	3780	3782	3785	3788	3790

TABLE A-3 continued  
RUBY DAM STORAGE - ELEVATION TABLE

GH	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
5335.0	3793	3795	3798	3801	3804	3807	3810	3813	3816	3819
5335.1	3822	3824	3827	3830	3833	3836	3839	3842	3845	3848
5335.2	3850	3853	3856	3859	3862	3865	3868	3871	3874	3877
5335.3	3879	3882	3885	3888	3891	3894	3897	3900	3903	3905
5335.4	3908	3911	3914	3917	3920	3923	3926	3929	3932	3934
5335.5	3937	3940	3943	3946	3949	3952	3955	3958	3961	3963
5335.6	3966	3969	3972	3975	3978	3981	3984	3987	3989	3992
5335.7	3995	3998	4001	4004	4007	4010	4013	4016	4018	4021
5335.8	4024	4027	4030	4033	4036	4039	4042	4045	4047	4050
5335.9	4053	4056	4059	4062	4065	4068	4071	4073	4076	4079
5336.0	4082	4085	4088	4091	4094	4097	4100	4102	4105	4108
5336.1	4111	4114	4117	4120	4123	4126	4128	4131	4134	4137
5336.2	4140	4143	4146	4149	4152	4155	4157	4160	4163	4166
5336.3	4169	4172	4175	4178	4181	4184	4186	4189	4192	4195
5336.4	4198	4201	4204	4207	4210	4212	4215	4218	4221	4224
5336.5	4227	4230	4233	4236	4239	4241	4244	4247	4250	4253
5336.6	4256	4259	4262	4265	4267	4270	4273	4276	4279	4282
5336.7	4285	4288	4291	4294	4296	4299	4302	4305	4308	4311
5336.8	4314	4317	4320	4323	4325	4328	4331	4334	4337	4340
5336.9	4343	4346	4349	4351	4354	4357	4360	4363	4366	4369
5337.0	4372	4375	4378	4380	4383	4386	4389	4392	4395	4398
5337.1	4401	4404	4407	4409	4412	4415	4418	4421	4424	4427
5337.2	4430	4433	4435	4438	4441	4444	4447	4450	4453	4456
5337.3	4459	4462	4464	4467	4470	4473	4476	4479	4482	4485
5337.4	4488	4490	4493	4496	4499	4502	4505	4508	4511	4514
5337.5	4517	4519	4522	4525	4528	4531	4534	4537	4540	4543
5337.6	4546	4548	4551	4554	4557	4560	4563	4566	4569	4572
5337.7	4574	4577	4580	4583	4586	4589	4592	4595	4598	4601
5337.8	4603	4606	4609	4612	4615	4618	4621	4624	4627	4629
5337.9	4632	4635	4638	4641	4644	4647	4650	4653	4656	4658
5338.0	4661	4664	4667	4670	4673	4676	4679	4682	4685	4687
5338.1	4690	4693	4696	4699	4702	4705	4708	4711	4713	4716
5338.2	4719	4722	4725	4728	4731	4734	4737	4740	4742	4745
5338.3	4748	4751	4754	4757	4760	4763	4766	4769	4771	4774
5338.4	4777	4780	4783	4786	4789	4792	4795	4797	4800	4803
5338.5	4806	4809	4812	4815	4818	4821	4824	4826	4829	4832
5338.6	4835	4838	4841	4844	4847	4850	4852	4855	4858	4861
5338.7	4864	4867	4870	4873	4876	4879	4881	4884	4887	4890
5338.8	4893	4896	4899	4902	4905	4908	4910	4913	4916	4919
5338.9	4922	4925	4928	4931	4934	4936	4939	4942	4945	4948
5339.0	4951	4954	4957	4960	4963	4965	4968	4971	4974	4977
5339.1	4980	4983	4986	4989	4991	4994	4997	5000	5003	5006
5339.2	5009	5012	5015	5018	5020	5023	5026	5029	5032	5035
5339.3	5038	5041	5044	5047	5049	5052	5055	5058	5061	5064
5339.4	5067	5070	5073	5075	5078	5081	5084	5087	5090	5093
5339.5	5096	5099	5102	5104	5107	5110	5113	5116	5119	5122
5339.6	5125	5128	5131	5133	5136	5139	5142	5145	5148	5151
5339.7	5154	5157	5159	5162	5165	5168	5171	5174	5177	5180
5339.8	5183	5186	5188	5191	5194	5197	5200	5203	5206	5209
5339.9	5212	5214	5217	5220	5223	5226	5229	5232	5235	5238

TABLE A-3 continued  
RUBY DAM STORAGE - ELEVATION TABLE

GH	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
5340.0	5241	5244	5247	5250	5254	5257	5260	5263	5267	5270
5340.1	5273	5277	5280	5283	5286	5290	5293	5296	5299	5303
5340.2	5306	5309	5312	5316	5319	5322	5326	5329	5332	5335
5340.3	5339	5342	5345	5348	5352	5355	5358	5362	5365	5368
5340.4	5371	5375	5378	5381	5384	5388	5391	5394	5398	5401
5340.5	5404	5407	5411	5414	5417	5420	5424	5427	5430	5433
5340.6	5437	5440	5443	5447	5450	5453	5456	5460	5463	5466
5340.7	5469	5473	5476	5479	5483	5486	5489	5492	5496	5499
5340.8	5502	5505	5509	5512	5515	5518	5522	5525	5528	5532
5340.9	5535	5538	5541	5545	5548	5551	5554	5558	5561	5564
5341.0	5568	5571	5574	5577	5581	5584	5587	5590	5594	5597
5341.1	5600	5604	5607	5610	5613	5617	5620	5623	5626	5630
5341.2	5633	5636	5639	5643	5646	5649	5653	5656	5659	5662
5341.3	5666	5669	5672	5675	5679	5682	5685	5689	5692	5695
5341.4	5698	5702	5705	5708	5711	5715	5718	5721	5725	5728
5341.5	5731	5734	5738	5741	5744	5747	5751	5754	5757	5760
5341.6	5764	5767	5770	5774	5777	5780	5783	5787	5790	5793
5341.7	5796	5800	5803	5806	5810	5813	5816	5819	5823	5826
5341.8	5829	5832	5836	5839	5842	5845	5849	5852	5855	5859
5341.9	5862	5865	5868	5872	5875	5878	5881	5885	5888	5891
5342.0	5895	5898	5901	5904	5908	5911	5914	5917	5921	5924
5342.1	5927	5931	5934	5937	5940	5944	5947	5950	5953	5957
5342.2	5960	5963	5966	5970	5973	5976	5980	5983	5986	5989
5342.3	5993	5996	5999	6002	6006	6009	6012	6016	6019	6022
5342.4	6025	6029	6032	6035	6038	6042	6045	6048	6052	6055
5342.5	6058	6061	6065	6068	6071	6074	6078	6081	6084	6087
5342.6	6091	6094	6097	6101	6104	6107	6110	6114	6117	6120
5342.7	6123	6127	6130	6133	6137	6140	6143	6146	6150	6153
5342.8	6156	6159	6163	6166	6169	6172	6176	6179	6182	6186
5342.9	6189	6192	6195	6199	6202	6205	6208	6212	6215	6218
5343.0	6222	6225	6228	6231	6235	6238	6241	6244	6248	6251
5343.1	6254	6258	6261	6264	6267	6271	6274	6277	6280	6284
5343.2	6287	6290	6293	6297	6300	6303	6307	6310	6313	6316
5343.3	6320	6323	6326	6329	6333	6336	6339	6343	6346	6349
5343.4	6352	6356	6359	6362	6365	6369	6372	6375	6379	6382
5343.5	6385	6388	6392	6395	6398	6401	6405	6408	6411	6414
5343.6	6418	6421	6424	6428	6431	6434	6437	6441	6444	6447
5343.7	6450	6454	6457	6460	6464	6467	6470	6473	6477	6480
5343.8	6483	6486	6490	6493	6496	6499	6503	6506	6509	6513
5343.9	6516	6519	6522	6526	6529	6532	6535	6539	6542	6545
5344.0	6549	6552	6555	6558	6562	6565	6568	6571	6575	6578
5344.1	6581	6585	6588	6591	6594	6598	6601	6604	6607	6611
5344.2	6614	6617	6620	6624	6627	6630	6634	6637	6640	6643
5344.3	6647	6650	6653	6656	6660	6663	6666	6670	6673	6676
5344.4	6679	6683	6686	6689	6692	6696	6699	6702	6706	6709
5344.5	6712	6715	6719	6722	6725	6728	6732	6735	6738	6741
5344.6	6745	6748	6751	6755	6758	6761	6764	6768	6771	6774
5344.7	6777	6781	6784	6787	6791	6794	6797	6800	6804	6807
5344.8	6810	6813	6817	6820	6823	6826	6830	6833	6836	6840
5344.9	6843	6846	6849	6853	6856	6859	6862	6866	6869	6872

TABLE A-3 continued  
RUBY DAM STORAGE - ELEVATION TABLE

GH	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
5345.0	6876	6879	6883	6887	6890	6894	6898	6901	6905	6909
5345.1	6912	6916	6920	6923	6927	6931	6934	6938	6942	6945
5345.2	6949	6953	6956	6960	6964	6967	6971	6975	6978	6982
5345.3	6986	6989	6993	6997	7000	7004	7008	7011	7015	7019
5345.4	7022	7026	7030	7033	7037	7041	7044	7048	7052	7055
5345.5	7059	7063	7066	7070	7074	7077	7081	7085	7088	7092
5345.6	7096	7099	7103	7107	7110	7114	7118	7121	7125	7129
5345.7	7132	7136	7140	7143	7147	7150	7154	7158	7161	7165
5345.8	7169	7172	7176	7180	7183	7187	7191	7194	7198	7202
5345.9	7205	7209	7213	7216	7220	7224	7227	7231	7235	7238
5346.0	7242	7246	7249	7253	7257	7260	7264	7268	7271	7275
5346.1	7279	7282	7286	7290	7293	7297	7301	7304	7308	7312
5346.2	7315	7319	7323	7326	7330	7334	7337	7341	7345	7348
5346.3	7352	7356	7359	7363	7367	7370	7374	7378	7381	7385
5346.4	7389	7392	7396	7400	7403	7407	7411	7414	7418	7422
5346.5	7425	7429	7433	7436	7440	7444	7447	7451	7455	7458
5346.6	7462	7466	7469	7473	7477	7480	7484	7488	7491	7495
5346.7	7499	7502	7506	7510	7513	7517	7521	7524	7528	7532
5346.8	7535	7539	7543	7546	7550	7554	7557	7561	7565	7568
5346.9	7572	7576	7579	7583	7587	7590	7594	7598	7601	7605
5347.0	7609	7612	7616	7620	7623	7627	7631	7634	7638	7642
5347.1	7645	7649	7653	7656	7660	7664	7667	7671	7675	7678
5347.2	7682	7686	7689	7693	7697	7700	7704	7708	7711	7715
5347.3	7719	7722	7726	7730	7733	7737	7741	7744	7748	7752
5347.4	7755	7759	7763	7766	7770	7774	7777	7781	7785	7788
5347.5	7792	7796	7799	7803	7807	7810	7814	7818	7821	7825
5347.6	7829	7832	7836	7840	7843	7847	7851	7854	7858	7862
5347.7	7865	7869	7873	7876	7880	7884	7887	7891	7895	7898
5347.8	7902	7906	7909	7913	7917	7920	7924	7928	7931	7935
5347.9	7939	7942	7946	7950	7953	7957	7961	7964	7968	7972
5348.0	7975	7979	7983	7986	7990	7994	7997	8001	8005	8008
5348.1	8012	8016	8019	8023	8027	8030	8034	8038	8041	8045
5348.2	8049	8052	8056	8060	8063	8067	8071	8074	8078	8082
5348.3	8085	8089	8093	8096	8100	8104	8107	8111	8115	8118
5348.4	8122	8126	8129	8133	8137	8140	8144	8148	8151	8155
5348.5	8159	8162	8166	8170	8173	8177	8181	8184	8188	8192
5348.6	8195	8199	8203	8206	8210	8214	8217	8221	8225	8228
5348.7	8232	8236	8239	8243	8247	8250	8254	8258	8261	8265
5348.8	8269	8272	8276	8280	8283	8287	8291	8294	8298	8302
5348.9	8305	8309	8313	8316	8320	8324	8327	8331	8335	8338
5349.0	8342	8346	8349	8353	8357	8360	8364	8368	8371	8375
5349.1	8379	8382	8386	8390	8393	8397	8401	8404	8408	8412
5349.2	8415	8419	8423	8426	8430	8434	8437	8441	8445	8448
5349.3	8452	8456	8459	8463	8467	8470	8474	8478	8481	8485
5349.4	8489	8492	8496	8500	8503	8507	8511	8514	8518	8522
5349.5	8525	8529	8533	8536	8540	8544	8547	8551	8555	8558
5349.6	8562	8566	8569	8573	8577	8580	8584	8588	8591	8595
5349.7	8599	8602	8606	8610	8613	8617	8621	8624	8628	8632
5349.8	8635	8639	8643	8646	8650	8654	8657	8661	8665	8668
5349.9	8672	8676	8679	8683	8687	8690	8694	8698	8701	8705

TABLE A-3 continued  
RUBY DAM STORAGE - ELEVATION TABLE

GH	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
5350.0	8709	8713	8717	8721	8725	8729	8733	8737	8741	8745
5350.1	8750	8754	8758	8762	8766	8770	8774	8778	8782	8786
5350.2	8791	8795	8799	8803	8807	8811	8815	8819	8823	8827
5350.3	8832	8836	8840	8844	8848	8852	8856	8860	8864	8868
5350.4	8873	8877	8881	8885	8889	8893	8897	8901	8905	8909
5350.5	8914	8918	8922	8926	8930	8934	8938	8942	8946	8950
5350.6	8955	8959	8963	8967	8971	8975	8979	8983	8987	8991
5350.7	8996	9000	9004	9008	9012	9016	9020	9024	9028	9032
5350.8	9037	9041	9045	9049	9053	9057	9061	9065	9069	9073
5350.9	9078	9082	9086	9090	9094	9098	9102	9106	9110	9114
5351.0	9119	9123	9127	9131	9135	9139	9143	9147	9151	9155
5351.1	9160	9164	9168	9172	9176	9180	9184	9188	9192	9196
5351.2	9201	9205	9209	9213	9217	9221	9225	9229	9233	9237
5351.3	9242	9246	9250	9254	9258	9262	9266	9270	9274	9278
5351.4	9283	9287	9291	9295	9299	9303	9307	9311	9315	9319
5351.5	9324	9328	9332	9336	9340	9344	9348	9352	9356	9360
5351.6	9365	9369	9373	9377	9381	9385	9389	9393	9397	9401
5351.7	9406	9410	9414	9418	9422	9426	9430	9434	9438	9442
5351.8	9447	9451	9455	9459	9463	9467	9471	9475	9479	9483
5351.9	9488	9492	9496	9500	9504	9508	9512	9516	9520	9524
5352.0	9529	9533	9537	9541	9545	9549	9553	9557	9561	9565
5352.1	9570	9574	9578	9582	9586	9590	9594	9598	9602	9606
5352.2	9611	9615	9619	9623	9627	9631	9635	9639	9643	9647
5352.3	9652	9656	9660	9664	9668	9672	9676	9680	9684	9688
5352.4	9693	9697	9701	9705	9709	9713	9717	9721	9725	9729
5352.5	9734	9738	9742	9746	9750	9754	9758	9762	9766	9770
5352.6	9775	9779	9783	9787	9791	9795	9799	9803	9807	9811
5352.7	9816	9820	9824	9828	9832	9836	9840	9844	9848	9852
5352.8	9857	9861	9865	9869	9873	9877	9881	9885	9889	9893
5352.9	9898	9902	9906	9910	9914	9918	9922	9926	9930	9934
5353.0	9939	9943	9947	9951	9955	9959	9963	9967	9971	9975
5353.1	9980	9984	9988	9992	9996	10000	10004	10008	10012	10016
5353.2	10021	10025	10029	10033	10037	10041	10045	10049	10053	10057
5353.3	10062	10066	10070	10074	10078	10082	10086	10090	10094	10098
5353.4	10103	10107	10111	10115	10119	10123	10127	10131	10135	10139
5353.5	10144	10148	10152	10156	10160	10164	10168	10172	10176	10180
5353.6	10185	10189	10193	10197	10201	10205	10209	10213	10217	10221
5353.7	10226	10230	10234	10238	10242	10246	10250	10254	10258	10262
5353.8	10267	10271	10275	10279	10283	10287	10291	10295	10299	10303
5353.9	10308	10312	10316	10320	10324	10328	10332	10336	10340	10344
5354.0	10349	10353	10357	10361	10365	10369	10373	10377	10381	10385
5354.1	10390	10394	10398	10402	10406	10410	10414	10418	10422	10426
5354.2	10431	10435	10439	10443	10447	10451	10455	10459	10463	10467
5354.3	10472	10476	10480	10484	10488	10492	10496	10500	10504	10508
5354.4	10513	10517	10521	10525	10529	10533	10537	10541	10545	10549
5354.5	10554	10558	10562	10566	10570	10574	10578	10582	10586	10590
5354.6	10595	10599	10603	10607	10611	10615	10619	10623	10627	10631
5354.7	10636	10640	10644	10648	10652	10656	10660	10664	10668	10672
5354.8	10677	10681	10685	10689	10693	10697	10701	10705	10709	10713
5354.9	10718	10722	10726	10730	10734	10738	10742	10746	10750	10754



TABLE A-3 continued  
RUBY DAM STORAGE - ELEVATION TABLE

GH	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
5355.0	10759	10763	10768	10772	10777	10782	10786	10791	10795	10800
5355.1	10805	10809	10814	10819	10823	10828	10832	10837	10842	10846
5355.2	10851	10855	10860	10865	10869	10874	10879	10883	10888	10892
5355.3	10897	10902	10906	10911	10915	10920	10925	10929	10934	10939
5355.4	10943	10948	10952	10957	10962	10966	10971	10976	10980	10985
5355.5	10989	10994	10999	11003	11008	11012	11017	11022	11026	11031
5355.6	11036	11040	11045	11049	11054	11059	11063	11068	11072	11077
5355.7	11082	11086	11091	11096	11100	11105	11109	11114	11119	11123
5355.8	11128	11132	11137	11142	11146	11151	11156	11160	11165	11169
5355.9	11174	11179	11183	11188	11192	11197	11202	11206	11211	11216
5356.0	11220	11225	11229	11234	11239	11243	11248	11252	11257	11262
5356.1	11266	11271	11276	11280	11285	11289	11294	11299	11303	11308
5356.2	11312	11317	11322	11326	11331	11336	11340	11345	11349	11354
5356.3	11359	11363	11368	11372	11377	11382	11386	11391	11396	11400
5356.4	11405	11409	11414	11419	11423	11428	11432	11437	11442	11446
5356.5	11451	11456	11460	11465	11469	11474	11479	11483	11488	11492
5356.6	11497	11502	11506	11511	11516	11520	11525	11529	11534	11539
5356.7	11543	11548	11553	11557	11562	11566	11571	11576	11580	11585
5356.8	11589	11594	11599	11603	11608	11613	11617	11622	11626	11631
5356.9	11636	11640	11645	11649	11654	11659	11663	11668	11673	11677
5357.0	11682	11686	11691	11696	11700	11705	11709	11714	11719	11723
5357.1	11728	11733	11737	11742	11746	11751	11756	11760	11765	11769
5357.2	11774	11779	11783	11788	11793	11797	11802	11806	11811	11816
5357.3	11820	11825	11829	11834	11839	11843	11848	11853	11857	11862
5357.4	11866	11871	11876	11880	11885	11889	11894	11899	11903	11908
5357.5	11913	11917	11922	11926	11931	11936	11940	11945	11949	11954
5357.6	11959	11963	11968	11973	11977	11982	11986	11991	11996	12000
5357.7	12005	12009	12014	12019	12023	12028	12033	12037	12042	12046
5357.8	12051	12056	12060	12065	12069	12074	12079	12083	12088	12093
5357.9	12097	12102	12106	12111	12116	12120	12125	12130	12134	12139
5358.0	12143	12148	12153	12157	12162	12166	12171	12176	12180	12185
5358.1	12190	12194	12199	12203	12208	12213	12217	12222	12226	12231
5358.2	12236	12240	12245	12250	12254	12259	12263	12268	12273	12277
5358.3	12282	12286	12291	12296	12300	12305	12310	12314	12319	12323
5358.4	12328	12333	12337	12342	12346	12351	12356	12360	12365	12370
5358.5	12374	12379	12383	12388	12393	12397	12402	12406	12411	12416
5358.6	12420	12425	12430	12434	12439	12443	12448	12453	12457	12462
5358.7	12466	12471	12476	12480	12485	12490	12494	12499	12503	12508
5358.8	12513	12517	12522	12526	12531	12536	12540	12545	12550	12554
5358.9	12559	12563	12568	12573	12577	12582	12586	12591	12596	12600
5359.0	12605	12610	12614	12619	12623	12628	12633	12637	12642	12646
5359.1	12651	12656	12660	12665	12670	12674	12679	12683	12688	12693
5359.2	12697	12702	12707	12711	12716	12720	12725	12730	12734	12739
5359.3	12743	12748	12753	12757	12762	12767	12771	12776	12780	12785
5359.4	12790	12794	12799	12803	12808	12813	12817	12822	12827	12831
5359.5	12836	12840	12845	12850	12854	12859	12863	12868	12873	12877
5359.6	12882	12887	12891	12896	12900	12905	12910	12914	12919	12923
5359.7	12928	12933	12937	12942	12947	12951	12956	12960	12965	12970
5359.8	12974	12979	12983	12988	12993	12997	13002	13007	13011	13016
5359.9	13020	13025	13030	13034	13039	13043	13048	13053	13057	13062

TABLE A-3 continued  
RUBY DAM STORAGE - ELEVATION TABLE

GH	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
5360.0	13067	13072	13077	13082	13088	13093	13098	13103	13108	13114
5360.1	13119	13124	13129	13135	13140	13145	13150	13156	13161	13166
5360.2	13171	13177	13182	13187	13192	13198	13203	13208	13213	13219
5360.3	13224	13229	13234	13239	13245	13250	13255	13260	13266	13271
5360.4	13276	13281	13287	13292	13297	13302	13308	13313	13318	13323
5360.5	13329	13334	13339	13344	13350	13355	13360	13365	13370	13376
5360.6	13381	13386	13391	13397	13402	13407	13412	13418	13423	13428
5360.7	13433	13439	13444	13449	13454	13460	13465	13470	13475	13481
5360.8	13486	13491	13496	13501	13507	13512	13517	13522	13528	13533
5360.9	13538	13543	13549	13554	13559	13564	13570	13575	13580	13585
5361.0	13591	13596	13601	13606	13612	13617	13622	13627	13632	13638
5361.1	13643	13648	13653	13659	13664	13669	13674	13680	13685	13690
5361.2	13695	13701	13706	13711	13716	13722	13727	13732	13737	13743
5361.3	13748	13753	13758	13763	13769	13774	13779	13784	13790	13795
5361.4	13800	13805	13811	13816	13821	13826	13832	13837	13842	13847
5361.5	13853	13858	13863	13868	13874	13879	13884	13889	13894	13900
5361.6	13905	13910	13915	13921	13926	13931	13936	13942	13947	13952
5361.7	13957	13963	13968	13973	13978	13984	13989	13994	13999	14005
5361.8	14010	14015	14020	14025	14031	14036	14041	14046	14052	14057
5361.9	14062	14067	14073	14078	14083	14088	14094	14099	14104	14109
5362.0	14115	14120	14125	14130	14136	14141	14146	14151	14156	14162
5362.1	14167	14172	14177	14183	14188	14193	14198	14204	14209	14214
5362.2	14219	14225	14230	14235	14240	14246	14251	14256	14261	14267
5362.3	14272	14277	14282	14287	14293	14298	14303	14308	14314	14319
5362.4	14324	14329	14335	14340	14345	14350	14356	14361	14366	14371
5362.5	14377	14382	14387	14392	14398	14403	14408	14413	14418	14424
5362.6	14429	14434	14439	14445	14450	14455	14460	14466	14471	14476
5362.7	14481	14487	14492	14497	14502	14508	14513	14518	14523	14529
5362.8	14534	14539	14544	14549	14555	14560	14565	14570	14576	14581
5362.9	14586	14591	14597	14602	14607	14612	14618	14623	14628	14633
5363.0	14639	14644	14649	14654	14660	14665	14670	14675	14680	14686
5363.1	14691	14696	14701	14707	14712	14717	14722	14728	14733	14738
5363.2	14743	14749	14754	14759	14764	14770	14775	14780	14785	14791
5363.3	14796	14801	14806	14811	14817	14822	14827	14832	14838	14843
5363.4	14848	14853	14859	14864	14869	14874	14880	14885	14890	14895
5363.5	14901	14906	14911	14916	14922	14927	14932	14937	14942	14948
5363.6	14953	14958	14963	14969	14974	14979	14984	14990	14995	15000
5363.7	15005	15011	15016	15021	15026	15032	15037	15042	15047	15053
5363.8	15058	15063	15068	15073	15079	15084	15089	15094	15100	15105
5363.9	15110	15115	15121	15126	15131	15136	15142	15147	15152	15157
5364.0	15163	15168	15173	15178	15184	15189	15194	15199	15204	15210
5364.1	15215	15220	15225	15231	15236	15241	15246	15252	15257	15262
5364.2	15267	15273	15278	15283	15288	15294	15299	15304	15309	15315
5364.3	15320	15325	15330	15335	15341	15346	15351	15356	15362	15367
5364.4	15372	15377	15383	15388	15393	15398	15404	15409	15414	15419
5364.5	15425	15430	15435	15440	15446	15451	15456	15461	15466	15472
5364.6	15477	15482	15487	15493	15498	15503	15508	15514	15519	15524
5364.7	15529	15535	15540	15545	15550	15556	15561	15566	15571	15577
5364.8	15582	15587	15592	15597	15603	15608	15613	15618	15624	15629
5364.9	15634	15639	15645	15650	15655	15660	15666	15671	15676	15681



TABLE A-3 continued  
RUBY DAM STORAGE - ELEVATION TABLE

GH	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
5365.0	15687	15692	15698	15704	15710	15716	15722	15728	15734	15739
5365.1	15745	15751	15757	15763	15769	15775	15781	15786	15792	15798
5365.2	15804	15810	15816	15822	15828	15833	15839	15845	15851	15857
5365.3	15863	15869	15875	15880	15886	15892	15898	15904	15910	15916
5365.4	15922	15927	15933	15939	15945	15951	15957	15963	15969	15974
5365.5	15980	15986	15992	15998	16004	16010	16016	16021	16027	16033
5365.6	16039	16045	16051	16057	16063	16068	16074	16080	16086	16092
5365.7	16098	16104	16110	16115	16121	16127	16133	16139	16145	16151
5365.8	16157	16163	16168	16174	16180	16186	16192	16198	16204	16210
5365.9	16215	16221	16227	16233	16239	16245	16251	16257	16262	16268
5366.0	16274	16280	16286	16292	16298	16304	16309	16315	16321	16327
5366.1	16333	16339	16345	16351	16356	16362	16368	16374	16380	16386
5366.2	16392	16398	16403	16409	16415	16421	16427	16433	16439	16445
5366.3	16450	16456	16462	16468	16474	16480	16486	16492	16497	16503
5366.4	16509	16515	16521	16527	16533	16539	16544	16550	16556	16562
5366.5	16568	16574	16580	16586	16591	16597	16603	16609	16615	16621
5366.6	16627	16633	16638	16644	16650	16656	16662	16668	16674	16680
5366.7	16685	16691	16697	16703	16709	16715	16721	16727	16732	16738
5366.8	16744	16750	16756	16762	16768	16774	16779	16785	16791	16797
5366.9	16803	16809	16815	16821	16826	16832	16838	16844	16850	16856
5367.0	16862	16868	16874	16879	16885	16891	16897	16903	16909	16915
5367.1	16921	16926	16932	16938	16944	16950	16956	16962	16968	16973
5367.2	16979	16985	16991	16997	17003	17009	17015	17020	17026	17032
5367.3	17038	17044	17050	17056	17062	17067	17073	17079	17085	17091
5367.4	17097	17103	17109	17114	17120	17126	17132	17138	17144	17150
5367.5	17156	17161	17167	17173	17179	17185	17191	17197	17203	17208
5367.6	17214	17220	17226	17232	17238	17244	17250	17255	17261	17267
5367.7	17273	17279	17285	17291	17297	17302	17308	17314	17320	17326
5367.8	17332	17338	17344	17349	17355	17361	17367	17373	17379	17385
5367.9	17391	17396	17402	17408	17414	17420	17426	17432	17438	17443
5368.0	17449	17455	17461	17467	17473	17479	17485	17490	17496	17502
5368.1	17508	17514	17520	17526	17532	17537	17543	17549	17555	17561
5368.2	17567	17573	17579	17584	17590	17596	17602	17608	17614	17620
5368.3	17626	17632	17637	17643	17649	17655	17661	17667	17673	17679
5368.4	17684	17690	17696	17702	17708	17714	17720	17726	17731	17737
5368.5	17743	17749	17755	17761	17767	17773	17778	17784	17790	17796
5368.6	17802	17808	17814	17820	17825	17831	17837	17843	17849	17855
5368.7	17861	17867	17872	17878	17884	17890	17896	17902	17908	17914
5368.8	17919	17925	17931	17937	17943	17949	17955	17961	17966	17972
5368.9	17978	17984	17990	17996	18002	18008	18013	18019	18025	18031
5369.0	18037	18043	18049	18055	18060	18066	18072	18078	18084	18090
5369.1	18096	18102	18107	18113	18119	18125	18131	18137	18143	18149
5369.2	18154	18160	18166	18172	18178	18184	18190	18196	18201	18207
5369.3	18213	18219	18225	18231	18237	18243	18248	18254	18260	18266
5369.4	18272	18278	18284	18290	18295	18301	18307	18313	18319	18325
5369.5	18331	18337	18343	18348	18354	18360	18366	18372	18378	18384
5369.6	18390	18395	18401	18407	18413	18419	18425	18431	18437	18442
5369.7	18448	18454	18460	18466	18472	18478	18484	18489	18495	18501
5369.8	18507	18513	18519	18525	18531	18536	18542	18548	18554	18560
5369.9	18566	18572	18578	18583	18589	18595	18601	18607	18613	18619

TABLE A-3 continued  
RUBY DAM STORAGE - ELEVATION TABLE

GH	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
5370.0	18625	18631	18638	18645	18651	18658	18665	18671	18678	18685
5370.1	18691	18698	18705	18712	18718	18725	18732	18738	18745	18752
5370.2	18758	18765	18772	18778	18785	18792	18798	18805	18812	18819
5370.3	18825	18832	18839	18845	18852	18859	18865	18872	18879	18885
5370.4	18892	18899	18906	18912	18919	18926	18932	18939	18946	18952
5370.5	18959	18966	18972	18979	18986	18992	18999	19006	19013	19019
5370.6	19026	19033	19039	19046	19053	19059	19066	19073	19079	19086
5370.7	19093	19100	19106	19113	19120	19126	19133	19140	19146	19153
5370.8	19160	19166	19173	19180	19187	19193	19200	19207	19213	19220
5370.9	19227	19233	19240	19247	19253	19260	19267	19273	19280	19287
5371.0	19294	19300	19307	19314	19320	19327	19334	19340	19347	19354
5371.1	19360	19367	19374	19381	19387	19394	19401	19407	19414	19421
5371.2	19427	19434	19441	19447	19454	19461	19467	19474	19481	19488
5371.3	19494	19501	19508	19514	19521	19528	19534	19541	19548	19554
5371.4	19561	19568	19575	19581	19588	19595	19601	19608	19615	19621
5371.5	19628	19635	19641	19648	19655	19661	19668	19675	19682	19688
5371.6	19695	19702	19708	19715	19722	19728	19735	19742	19748	19755
5371.7	19762	19769	19775	19782	19789	19795	19802	19809	19815	19822
5371.8	19829	19835	19842	19849	19856	19862	19869	19876	19882	19889
5371.9	19896	19902	19909	19916	19922	19929	19936	19942	19949	19956
5372.0	19963	19969	19976	19983	19989	19996	20003	20009	20016	20023
5372.1	20029	20036	20043	20050	20056	20063	20070	20076	20083	20090
5372.2	20096	20103	20110	20116	20123	20130	20136	20143	20150	20157
5372.3	20163	20170	20177	20183	20190	20197	20203	20210	20217	20223
5372.4	20230	20237	20244	20250	20257	20264	20270	20277	20284	20290
5372.5	20297	20304	20310	20317	20324	20330	20337	20344	20351	20357
5372.6	20364	20371	20377	20384	20391	20397	20404	20411	20417	20424
5372.7	20431	20438	20444	20451	20458	20464	20471	20478	20484	20491
5372.8	20498	20504	20511	20518	20525	20531	20538	20545	20551	20558
5372.9	20565	20571	20578	20585	20591	20598	20605	20611	20618	20625
5373.0	20632	20638	20645	20652	20658	20665	20672	20678	20685	20692
5373.1	20698	20705	20712	20719	20725	20732	20739	20745	20752	20759
5373.2	20765	20772	20779	20785	20792	20799	20805	20812	20819	20826
5373.3	20832	20839	20846	20852	20859	20866	20872	20879	20886	20892
5373.4	20899	20906	20913	20919	20926	20933	20939	20946	20953	20959
5373.5	20966	20973	20979	20986	20993	20999	21006	21013	21020	21026
5373.6	21033	21040	21046	21053	21060	21066	21073	21080	21086	21093
5373.7	21100	21107	21113	21120	21127	21133	21140	21147	21153	21160
5373.8	21167	21173	21180	21187	21194	21200	21207	21214	21220	21227
5373.9	21234	21240	21247	21254	21260	21267	21274	21280	21287	21294
5374.0	21301	21307	21314	21321	21327	21334	21341	21347	21354	21361
5374.1	21367	21374	21381	21388	21394	21401	21408	21414	21421	21428
5374.2	21434	21441	21448	21454	21461	21468	21474	21481	21488	21495
5374.3	21501	21508	21515	21521	21528	21535	21541	21548	21555	21561
5374.4	21568	21575	21582	21588	21595	21602	21608	21615	21622	21628
5374.5	21635	21642	21648	21655	21662	21668	21675	21682	21689	21695
5374.6	21702	21709	21715	21722	21729	21735	21742	21749	21755	21762
5374.7	21769	21776	21782	21789	21796	21802	21809	21816	21822	21829
5374.8	21836	21842	21849	21856	21863	21869	21876	21883	21889	21896
5374.9	21903	21909	21916	21923	21929	21936	21943	21949	21956	21963

TABLE A-3 continued  
RUBY DAM STORAGE - ELEVATION TABLE

GH	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
5375.0	21970	21977	21985	21993	22000	22008	22016	22024	22031	22039
5375.1	22047	22055	22062	22070	22078	22086	22093	22101	22109	22116
5375.2	22124	22132	22140	22147	22155	22163	22171	22178	22186	22194
5375.3	22201	22209	22217	22225	22232	22240	22248	22256	22263	22271
5375.4	22279	22286	22294	22302	22310	22317	22325	22333	22341	22348
5375.5	22356	22364	22372	22379	22387	22395	22402	22410	22418	22426
5375.6	22433	22441	22449	22457	22464	22472	22480	22487	22495	22503
5375.7	22511	22518	22526	22534	22542	22549	22557	22565	22572	22580
5375.8	22588	22596	22603	22611	22619	22627	22634	22642	22650	22658
5375.9	22665	22673	22681	22688	22696	22704	22712	22719	22727	22735
5376.0	22743	22750	22758	22766	22773	22781	22789	22797	22804	22812
5376.1	22820	22828	22835	22843	22851	22859	22866	22874	22882	22889
5376.2	22897	22905	22913	22920	22928	22936	22944	22951	22959	22967
5376.3	22974	22982	22990	22998	23005	23013	23021	23029	23036	23044
5376.4	23052	23059	23067	23075	23083	23090	23098	23106	23114	23121
5376.5	23129	23137	23145	23152	23160	23168	23175	23183	23191	23199
5376.6	23206	23214	23222	23230	23237	23245	23253	23260	23268	23276
5376.7	23284	23291	23299	23307	23315	23322	23330	23338	23345	23353
5376.8	23361	23369	23376	23384	23392	23400	23407	23415	23423	23431
5376.9	23438	23446	23454	23461	23469	23477	23485	23492	23500	23508
5377.0	23516	23523	23531	23539	23546	23554	23562	23570	23577	23585
5377.1	23593	23601	23608	23616	23624	23632	23639	23647	23655	23662
5377.2	23670	23678	23686	23693	23701	23709	23717	23724	23732	23740
5377.3	23747	23755	23763	23771	23778	23786	23794	23802	23809	23817
5377.4	23825	23832	23840	23848	23856	23863	23871	23879	23887	23894
5377.5	23902	23910	23918	23925	23933	23941	23948	23956	23964	23972
5377.6	23979	23987	23995	24003	24010	24018	24026	24033	24041	24049
5377.7	24057	24064	24072	24080	24088	24095	24103	24111	24118	24126
5377.8	24134	24142	24149	24157	24165	24173	24180	24188	24196	24204
5377.9	24211	24219	24227	24234	24242	24250	24258	24265	24273	24281
5378.0	24289	24296	24304	24312	24319	24327	24335	24343	24350	24358
5378.1	24366	24374	24381	24389	24397	24405	24412	24420	24428	24435
5378.2	24443	24451	24459	24466	24474	24482	24490	24497	24505	24513
5378.3	24520	24528	24536	24544	24551	24559	24567	24575	24582	24590
5378.4	24598	24605	24613	24621	24629	24636	24644	24652	24660	24667
5378.5	24675	24683	24691	24698	24706	24714	24721	24729	24737	24745
5378.6	24752	24760	24768	24776	24783	24791	24799	24806	24814	24822
5378.7	24830	24837	24845	24853	24861	24868	24876	24884	24891	24899
5378.8	24907	24915	24922	24930	24938	24946	24953	24961	24969	24977
5378.9	24984	24992	25000	25007	25015	25023	25031	25038	25046	25054
5379.0	25062	25069	25077	25085	25092	25100	25108	25116	25123	25131
5379.1	25139	25147	25154	25162	25170	25178	25185	25193	25201	25208
5379.2	25216	25224	25232	25239	25247	25255	25263	25270	25278	25286
5379.3	25293	25301	25309	25317	25324	25332	25340	25348	25355	25363
5379.4	25371	25378	25386	25394	25402	25409	25417	25425	25433	25440
5379.5	25448	25456	25464	25471	25479	25487	25494	25502	25510	25518
5379.6	25525	25533	25541	25549	25556	25564	25572	25579	25587	25595
5379.7	25603	25610	25618	25626	25634	25641	25649	25657	25664	25672
5379.8	25680	25688	25695	25703	25711	25719	25726	25734	25742	25750
5379.9	25757	25765	25773	25780	25788	25796	25804	25811	25819	25827

TABLE A-3 continued  
RUBY DAM STORAGE - ELEVATION TABLE

GH	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
5380.0	25835	25843	25852	25860	25869	25877	25886	25895	25903	25912
5380.1	25920	25929	25937	25946	25954	25963	25972	25980	25989	25997
5380.2	26006	26014	26023	26032	26040	26049	26057	26066	26074	26083
5380.3	26092	26100	26109	26117	26126	26134	26143	26151	26160	26169
5380.4	26177	26186	26194	26203	26211	26220	26229	26237	26246	26254
5380.5	26263	26271	26280	26289	26297	26306	26314	26323	26331	26340
5380.6	26349	26357	26366	26374	26383	26391	26400	26408	26417	26426
5380.7	26434	26443	26451	26460	26468	26477	26486	26494	26503	26511
5380.8	26520	26528	26537	26546	26554	26563	26571	26580	26588	26597
5380.9	26605	26614	26623	26631	26640	26648	26657	26665	26674	26683
5381.0	26691	26700	26708	26717	26725	26734	26743	26751	26760	26768
5381.1	26777	26785	26794	26803	26811	26820	26828	26837	26845	26854
5381.2	26862	26871	26880	26888	26897	26905	26914	26922	26931	26940
5381.3	26948	26957	26965	26974	26982	26991	27000	27008	27017	27025
5381.4	27034	27042	27051	27059	27068	27077	27085	27094	27102	27111
5381.5	27119	27128	27137	27145	27154	27162	27171	27179	27188	27197
5381.6	27205	27214	27222	27231	27239	27248	27257	27265	27274	27282
5381.7	27291	27299	27308	27316	27325	27334	27342	27351	27359	27368
5381.8	27376	27385	27394	27402	27411	27419	27428	27436	27445	27454
5381.9	27462	27471	27479	27488	27496	27505	27513	27522	27531	27539
5382.0	27548	27556	27565	27573	27582	27591	27599	27608	27616	27625
5382.1	27633	27642	27651	27659	27668	27676	27685	27693	27702	27711
5382.2	27719	27728	27736	27745	27753	27762	27770	27779	27788	27796
5382.3	27805	27813	27822	27830	27839	27848	27856	27865	27873	27882
5382.4	27890	27899	27908	27916	27925	27933	27942	27950	27959	27967
5382.5	27976	27985	27993	28002	28010	28019	28027	28036	28045	28053
5382.6	28062	28070	28079	28087	28096	28105	28113	28122	28130	28139
5382.7	28147	28156	28165	28173	28182	28190	28199	28207	28216	28224
5382.8	28233	28242	28250	28259	28267	28276	28284	28293	28302	28310
5382.9	28319	28327	28336	28344	28353	28362	28370	28379	28387	28396
5383.0	28404	28413	28421	28430	28439	28447	28456	28464	28473	28481
5383.1	28490	28499	28507	28516	28524	28533	28541	28550	28559	28567
5383.2	28576	28584	28593	28601	28610	28618	28627	28636	28644	28653
5383.3	28661	28670	28678	28687	28696	28704	28713	28721	28730	28738
5383.4	28747	28756	28764	28773	28781	28790	28798	28807	28816	28824
5383.5	28833	28841	28850	28858	28867	28875	28884	28893	28901	28910
5383.6	28918	28927	28935	28944	28953	28961	28970	28978	28987	28995
5383.7	29004	29013	29021	29030	29038	29047	29055	29064	29072	29081
5383.8	29090	29098	29107	29115	29124	29132	29141	29150	29158	29167
5383.9	29175	29184	29192	29201	29210	29218	29227	29235	29244	29252
5384.0	29261	29270	29278	29287	29295	29304	29312	29321	29329	29338
5384.1	29347	29355	29364	29372	29381	29389	29398	29407	29415	29424
5384.2	29432	29441	29449	29458	29467	29475	29484	29492	29501	29509
5384.3	29518	29526	29535	29544	29552	29561	29569	29578	29586	29595
5384.4	29604	29612	29621	29629	29638	29646	29655	29664	29672	29681
5384.5	29689	29698	29706	29715	29724	29732	29741	29749	29758	29766
5384.6	29775	29783	29792	29801	29809	29818	29826	29835	29843	29852
5384.7	29861	29869	29878	29886	29895	29903	29912	29921	29929	29938
5384.8	29946	29955	29963	29972	29980	29989	29998	30006	30015	30023
5384.9	30032	30040	30049	30058	30066	30075	30083	30092	30100	30109

TABLE A-3 continued  
RUBY DAM STORAGE - ELEVATION TABLE

GH	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
5385.0	30118	30127	30136	30145	30154	30163	30173	30182	30191	30200
5385.1	30209	30218	30228	30237	30246	30255	30264	30273	30283	30292
5385.2	30301	30310	30319	30328	30338	30347	30356	30365	30374	30383
5385.3	30393	30402	30411	30420	30429	30438	30448	30457	30466	30475
5385.4	30484	30494	30503	30512	30521	30530	30539	30549	30558	30567
5385.5	30576	30585	30594	30604	30613	30622	30631	30640	30649	30659
5385.6	30668	30677	30686	30695	30704	30714	30723	30732	30741	30750
5385.7	30759	30769	30778	30787	30796	30805	30814	30824	30833	30842
5385.8	30851	30860	30869	30879	30888	30897	30906	30915	30925	30934
5385.9	30943	30952	30961	30970	30980	30989	30998	31007	31016	31025
5386.0	31035	31044	31053	31062	31071	31080	31090	31099	31108	31117
5386.1	31126	31135	31145	31154	31163	31172	31181	31190	31200	31209
5386.2	31218	31227	31236	31245	31255	31264	31273	31282	31291	31300
5386.3	31310	31319	31328	31337	31346	31355	31365	31374	31383	31392
5386.4	31401	31411	31420	31429	31438	31447	31456	31466	31475	31484
5386.5	31493	31502	31511	31521	31530	31539	31548	31557	31566	31576
5386.6	31585	31594	31603	31612	31621	31631	31640	31649	31658	31667
5386.7	31676	31686	31695	31704	31713	31722	31731	31741	31750	31759
5386.8	31768	31777	31786	31796	31805	31814	31823	31832	31842	31851
5386.9	31860	31869	31878	31887	31897	31906	31915	31924	31933	31942
5387.0	31952	31961	31970	31979	31988	31997	32007	32016	32025	32034
5387.1	32043	32052	32062	32071	32080	32089	32098	32107	32117	32126
5387.2	32135	32144	32153	32162	32172	32181	32190	32199	32208	32217
5387.3	32227	32236	32245	32254	32263	32272	32282	32291	32300	32309
5387.4	32318	32328	32337	32346	32355	32364	32373	32383	32392	32401
5387.5	32410	32419	32428	32438	32447	32456	32465	32474	32483	32493
5387.6	32502	32511	32520	32529	32538	32548	32557	32566	32575	32584
5387.7	32593	32603	32612	32621	32630	32639	32648	32658	32667	32676
5387.8	32685	32694	32703	32713	32722	32731	32740	32749	32759	32768
5387.9	32777	32786	32795	32804	32814	32823	32832	32841	32850	32859
5388.0	32869	32878	32887	32896	32905	32914	32924	32933	32942	32951
5388.1	32960	32969	32979	32988	32997	33006	33015	33024	33034	33043
5388.2	33052	33061	33070	33079	33089	33098	33107	33116	33125	33134
5388.3	33144	33153	33162	33171	33180	33189	33199	33208	33217	33226
5388.4	33235	33245	33254	33263	33272	33281	33290	33300	33309	33318
5388.5	33327	33336	33345	33355	33364	33373	33382	33391	33400	33410
5388.6	33419	33428	33437	33446	33455	33465	33474	33483	33492	33501
5388.7	33510	33520	33529	33538	33547	33556	33565	33575	33584	33593
5388.8	33602	33611	33620	33630	33639	33648	33657	33666	33676	33685
5388.9	33694	33703	33712	33721	33731	33740	33749	33758	33767	33776
5389.0	33786	33795	33804	33813	33822	33831	33841	33850	33859	33868
5389.1	33877	33886	33896	33905	33914	33923	33932	33941	33951	33960
5389.2	33969	33978	33987	33996	34006	34015	34024	34033	34042	34051
5389.3	34061	34070	34079	34088	34097	34106	34115	34125	34134	34143
5389.4	34152	34162	34171	34180	34189	34198	34207	34217	34226	34235
5389.5	34244	34253	34262	34272	34281	34290	34299	34308	34317	34327
5389.6	34336	34345	34354	34363	34372	34382	34391	34400	34409	34418
5389.7	34427	34437	34446	34455	34464	34473	34482	34492	34501	34510
5389.8	34519	34528	34537	34547	34556	34565	34574	34583	34593	34602
5389.9	34611	34620	34629	34638	34648	34657	34666	34675	34684	34693



TABLE A-3 continued  
RUBY DAM STORAGE - ELEVATION TABLE

GH	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
5390.0	34703	34712	34722	34732	34741	34751	34760	34770	34780	34789
5390.1	34799	34809	34818	34828	34838	34847	34857	34867	34876	34886
5390.2	34896	34905	34915	34924	34934	34944	34953	34963	34973	34982
5390.3	34992	35002	35011	35021	35031	35040	35050	35060	35069	35079
5390.4	35089	35098	35108	35117	35127	35137	35146	35156	35166	35175
5390.5	35185	35195	35204	35214	35224	35233	35243	35253	35262	35272
5390.6	35282	35291	35301	35311	35320	35330	35339	35349	35359	35368
5390.7	35378	35388	35397	35407	35417	35426	35436	35446	35455	35465
5390.8	35475	35484	35494	35504	35513	35523	35532	35542	35552	35561
5390.9	35571	35581	35590	35600	35610	35619	35629	35639	35648	35658
5391.0	35668	35677	35687	35697	35706	35716	35725	35735	35745	35754
5391.1	35764	35774	35783	35793	35803	35812	35822	35832	35841	35851
5391.2	35861	35870	35880	35889	35899	35909	35918	35928	35938	35947
5391.3	35957	35967	35976	35986	35996	36005	36015	36025	36034	36044
5391.4	36054	36063	36073	36082	36092	36102	36111	36121	36131	36140
5391.5	36150	36160	36169	36179	36189	36198	36208	36218	36227	36237
5391.6	36247	36256	36266	36276	36285	36295	36304	36314	36324	36333
5391.7	36343	36353	36362	36372	36382	36391	36401	36411	36420	36430
5391.8	36440	36449	36459	36469	36478	36488	36497	36507	36517	36526
5391.9	36536	36546	36555	36565	36575	36584	36594	36604	36613	36623
5392.0	36633	36643	36653	36663	36673	36683	36693	36703	36713	36723
5392.1	36734	36744	36754	36764	36774	36784	36794	36804	36814	36824
5392.2	36834	36845	36855	36865	36875	36885	36895	36905	36915	36925
5392.3	36935	36946	36956	36966	36976	36986	36996	37006	37016	37026
5392.4	37036	37047	37057	37067	37077	37087	37097	37107	37117	37127
5392.5	37137	37147	37158	37168	37178	37188	37198	37208	37218	37228
5392.6	37238	37248	37259	37269	37279	37289	37299	37309	37319	37329
5392.7	37339	37349	37360	37370	37380	37390	37400	37410	37420	37430
5392.8	37440	37450	37460	37471	37481	37491	37501	37511	37521	37531
5392.9	37541	37551	37561	37572	37582	37592	37602	37612	37622	37632
5393.0	37642	37652	37662	37673	37683	37693	37703	37713	37723	37733
5393.1	37743	37753	37763	37773	37784	37794	37804	37814	37824	37834
5393.2	37844	37854	37864	37874	37885	37895	37905	37915	37925	37935
5393.3	37945	37955	37965	37975	37986	37996	38006	38016	38026	38036
5393.4	38046	38056	38066	38076	38086	38097	38107	38117	38127	38137
5393.5	38147	38157	38167	38177	38187	38198	38208	38218	38228	38238
5393.6	38248	38258	38268	38278	38288	38299	38309	38319	38329	38339
5393.7	38349	38359	38369	38379	38389	38399	38410	38420	38430	38440
5393.8	38450	38460	38470	38480	38490	38500	38511	38521	38531	38541
5393.9	38551	38561	38571	38581	38591	38601	38611	38622	38632	38642
5394.0	38652	38662	38672	38682	38692	38702	38712	38723	38733	38743
5394.1	38753	38763	38773	38783	38793	38803	38813	38824	38834	38844
5394.2	38854	38864	38874	38884	38894	38904	38914	38924	38935	38945
5394.3	38955	38965	38975	38985	38995	39005	39015	39025	39036	39046
5394.4	39056	39066	39076	39086	39096	39106	39116	39126	39137	39147
5394.5	39157	39167	39177	39187	39197	39207	39217	39227	39237	39248
5394.6	39258	39268	39278	39288	39298	39308	39318	39328	39338	39349
5394.7	39359	39369	39379	39389	39399	39409	39419	39429	39439	39450
5394.8	39460	39470	39480	39490	39500	39510	39520	39530	39540	39550
5394.9	39561	39571	39581	39591	39601	39611	39621	39631	39641	39651

TABLE A-3 continued  
RUBY DAM STORAGE - ELEVATION TABLE

GH	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
5395.0	39662	39672	39683	39694	39705	39716	39727	39738	39749	39760
5395.1	39771	39782	39792	39803	39814	39825	39836	39847	39858	39869
5395.2	39880	39891	39901	39912	39923	39934	39945	39956	39967	39978
5395.3	39989	40000	40011	40021	40032	40043	40054	40065	40076	40087
5395.4	40098	40109	40120	40131	40141	40152	40163	40174	40185	40196
5395.5	40207	40218	40229	40240	40250	40261	40272	40283	40294	40305
5395.6	40316	40327	40338	40349	40360	40370	40381	40392	40403	40414
5395.7	40425	40436	40447	40458	40469	40479	40490	40501	40512	40523
5395.8	40534	40545	40556	40567	40578	40589	40599	40610	40621	40632
5395.9	40643	40654	40665	40676	40687	40698	40709	40719	40730	40741
5396.0	40752	40763	40774	40785	40796	40807	40818	40828	40839	40850
5396.1	40861	40872	40883	40894	40905	40916	40927	40938	40948	40959
5396.2	40970	40981	40992	41003	41014	41025	41036	41047	41058	41068
5396.3	41079	41090	41101	41112	41123	41134	41145	41156	41167	41177
5396.4	41188	41199	41210	41221	41232	41243	41254	41265	41276	41287
5396.5	41297	41308	41319	41330	41341	41352	41363	41374	41385	41396
5396.6	41407	41417	41428	41439	41450	41461	41472	41483	41494	41505
5396.7	41516	41526	41537	41548	41559	41570	41581	41592	41603	41614
5396.8	41625	41636	41646	41657	41668	41679	41690	41701	41712	41723
5396.9	41734	41745	41756	41766	41777	41788	41799	41810	41821	41832
5397.0	41843	41854	41865	41875	41886	41897	41908	41919	41930	41941
5397.1	41952	41963	41974	41985	41995	42006	42017	42028	42039	42050
5397.2	42061	42072	42083	42094	42104	42115	42126	42137	42148	42159
5397.3	42170	42181	42192	42203	42214	42224	42235	42246	42257	42268
5397.4	42279	42290	42301	42312	42323	42334	42344	42355	42366	42377
5397.5	42388	42399	42410	42421	42432	42443	42453	42464	42475	42486
5397.6	42497	42508	42519	42530	42541	42552	42563	42573	42584	42595
5397.7	42606	42617	42628	42639	42650	42661	42672	42683	42693	42704
5397.8	42715	42726	42737	42748	42759	42770	42781	42792	42802	42813
5397.9	42824	42835	42846	42857	42868	42879	42890	42901	42912	42922
5398.0	42933	42944	42955	42966	42977	42988	42999	43010	43021	43032
5398.1	43042	43053	43064	43075	43086	43097	43108	43119	43130	43141
5398.2	43151	43162	43173	43184	43195	43206	43217	43228	43239	43250
5398.3	43261	43271	43282	43293	43304	43315	43326	43337	43348	43359
5398.4	43370	43380	43391	43402	43413	43424	43435	43446	43457	43468
5398.5	43479	43490	43500	43511	43522	43533	43544	43555	43566	43577
5398.6	43588	43599	43610	43620	43631	43642	43653	43664	43675	43686
5398.7	43697	43708	43719	43729	43740	43751	43762	43773	43784	43795
5398.8	43806	43817	43828	43839	43849	43860	43871	43882	43893	43904
5398.9	43915	43926	43937	43948	43959	43969	43980	43991	44002	44013
5399.0	44024	44035	44046	44057	44068	44078	44089	44100	44111	44122
5399.1	44133	44144	44155	44166	44177	44188	44198	44209	44220	44231
5399.2	44242	44253	44264	44275	44286	44297	44308	44318	44329	44340
5399.3	44351	44362	44373	44384	44395	44406	44417	44427	44438	44449
5399.4	44460	44471	44482	44493	44504	44515	44526	44537	44547	44558
5399.5	44569	44580	44591	44602	44613	44624	44635	44646	44656	44667
5399.6	44678	44689	44700	44711	44722	44733	44744	44755	44766	44776
5399.7	44787	44798	44809	44820	44831	44842	44853	44864	44875	44886
5399.8	44896	44907	44918	44929	44940	44951	44962	44973	44984	44995
5399.9	45005	45016	45027	45038	45049	45060	45071	45082	45093	45104

TABLE A-3 continued  
RUBY DAM STORAGE - ELEVATION TABLE

GH	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
5400.0	45115	45126	45138	45150	45162	45174	45185	45197	45209	45221
5400.1	45233	45245	45256	45268	45280	45292	45304	45315	45327	45339
5400.2	45351	45363	45375	45386	45398	45410	45422	45434	45445	45457
5400.3	45469	45481	45493	45504	45516	45528	45540	45552	45564	45575
5400.4	45587	45599	45611	45623	45634	45646	45658	45670	45682	45694
5400.5	45705	45717	45729	45741	45753	45764	45776	45788	45800	45812
5400.6	45824	45835	45847	45859	45871	45883	45894	45906	45918	45930
5400.7	45942	45953	45965	45977	45989	46001	46013	46024	46036	46048
5400.8	46060	46072	46083	46095	46107	46119	46131	46143	46154	46166
5400.9	46178	46190	46202	46213	46225	46237	46249	46261	46273	46284
5401.0	46296	46308	46320	46332	46343	46355	46367	46379	46391	46402
5401.1	46414	46426	46438	46450	46462	46473	46485	46497	46509	46521
5401.2	46532	46544	46556	46568	46580	46592	46603	46615	46627	46639
5401.3	46651	46662	46674	46686	46698	46710	46722	46733	46745	46757
5401.4	46769	46781	46792	46804	46816	46828	46840	46852	46863	46875
5401.5	46887	46899	46911	46922	46934	46946	46958	46970	46981	46993
5401.6	47005	47017	47029	47041	47052	47064	47076	47088	47100	47111
5401.7	47123	47135	47147	47159	47171	47182	47194	47206	47218	47230
5401.8	47241	47253	47265	47277	47289	47301	47312	47324	47336	47348
5401.9	47360	47371	47383	47395	47407	47419	47430	47442	47454	47466
5402.0	47478	47490	47501	47513	47525	47537	47549	47560	47572	47584
5402.1	47596	47608	47620	47631	47643	47655	47667	47679	47690	47702
5402.2	47714	47726	47738	47750	47761	47773	47785	47797	47809	47820
5402.3	47832	47844	47856	47868	47879	47891	47903	47915	47927	47939
5402.4	47950	47962	47974	47986	47998	48009	48021	48033	48045	48057
5402.5	48069	48080	48092	48104	48116	48128	48139	48151	48163	48175
5402.6	48187	48199	48210	48222	48234	48246	48258	48269	48281	48293
5402.7	48305	48317	48329	48340	48352	48364	48376	48388	48399	48411
5402.8	48423	48435	48447	48458	48470	48482	48494	48506	48518	48529
5402.9	48541	48553	48565	48577	48588	48600	48612	48624	48636	48648
5403.0	48659	48671	48683	48695	48707	48718	48730	48742	48754	48766
5403.1	48778	48789	48801	48813	48825	48837	48848	48860	48872	48884
5403.2	48896	48907	48919	48931	48943	48955	48967	48978	48990	49002
5403.3	49014	49026	49037	49049	49061	49073	49085	49097	49108	49120
5403.4	49132	49144	49156	49167	49179	49191	49203	49215	49227	49238
5403.5	49250	49262	49274	49286	49297	49309	49321	49333	49345	49356
5403.6	49368	49380	49392	49404	49416	49427	49439	49451	49463	49475
5403.7	49486	49498	49510	49522	49534	49546	49557	49569	49581	49593
5403.8	49605	49616	49628	49640	49652	49664	49676	49687	49699	49711
5403.9	49723	49735	49746	49758	49770	49782	49794	49806	49817	49829
5404.0	49841	49853	49865	49876	49888	49900	49912	49924	49935	49947
5404.1	49959	49971	49983	49995	50006	50018	50030	50042	50054	50065
5404.2	50077	50089	50101	50113	50125	50136	50148	50160	50172	50184
5404.3	50195	50207	50219	50231	50243	50255	50266	50278	50290	50302
5404.4	50314	50325	50337	50349	50361	50373	50384	50396	50408	50420
5404.5	50432	50444	50455	50467	50479	50491	50503	50514	50526	50538
5404.6	50550	50562	50574	50585	50597	50609	50621	50633	50644	50656
5404.7	50668	50680	50692	50704	50715	50727	50739	50751	50763	50774
5404.8	50786	50798	50810	50822	50833	50845	50857	50869	50881	50893
5404.9	50904	50916	50928	50940	50952	50963	50975	50987	50999	51011



TABLE A-3 continued  
RUBY DAM STORAGE - ELEVATION TABLE

GH	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
5405.0	51023	51035	51048	51061	51073	51086	51099	51111	51124	51137
5405.1	51150	51162	51175	51188	51200	51213	51226	51238	51251	51264
5405.2	51276	51289	51302	51315	51327	51340	51353	51365	51378	51391
5405.3	51403	51416	51429	51442	51454	51467	51480	51492	51505	51518
5405.4	51530	51543	51556	51568	51581	51594	51607	51619	51632	51645
5405.5	51657	51670	51683	51695	51708	51721	51734	51746	51759	51772
5405.6	51784	51797	51810	51822	51835	51848	51860	51873	51886	51899
5405.7	51911	51924	51937	51949	51962	51975	51987	52000	52013	52026
5405.8	52038	52051	52064	52076	52089	52102	52114	52127	52140	52152
5405.9	52165	52178	52191	52203	52216	52229	52241	52254	52267	52279
5406.0	52292	52305	52318	52330	52343	52356	52368	52381	52394	52406
5406.1	52419	52432	52445	52457	52470	52483	52495	52508	52521	52533
5406.2	52546	52559	52571	52584	52597	52610	52622	52635	52648	52660
5406.3	52673	52686	52698	52711	52724	52737	52749	52762	52775	52787
5406.4	52800	52813	52825	52838	52851	52863	52876	52889	52902	52914
5406.5	52927	52940	52952	52965	52978	52990	53003	53016	53029	53041
5406.6	53054	53067	53079	53092	53105	53117	53130	53143	53155	53168
5406.7	53181	53194	53206	53219	53232	53244	53257	53270	53282	53295
5406.8	53308	53321	53333	53346	53359	53371	53384	53397	53409	53422
5406.9	53435	53447	53460	53473	53486	53498	53511	53524	53536	53549
5407.0	53562	53574	53587	53600	53613	53625	53638	53651	53663	53676
5407.1	53689	53701	53714	53727	53739	53752	53765	53778	53790	53803
5407.2	53816	53828	53841	53854	53866	53879	53892	53905	53917	53930
5407.3	53943	53955	53968	53981	53993	54006	54019	54032	54044	54057
5407.4	54070	54082	54095	54108	54120	54133	54146	54158	54171	54184
5407.5	54197	54209	54222	54235	54247	54260	54273	54285	54298	54311
5407.6	54324	54336	54349	54362	54374	54387	54400	54412	54425	54438
5407.7	54450	54463	54476	54489	54501	54514	54527	54539	54552	54565
5407.8	54577	54590	54603	54616	54628	54641	54654	54666	54679	54692
5407.9	54704	54717	54730	54742	54755	54768	54781	54793	54806	54819
5408.0	54831	54844	54857	54869	54882	54895	54908	54920	54933	54946
5408.1	54958	54971	54984	54996	55009	55022	55034	55047	55060	55073
5408.2	55085	55098	55111	55123	55136	55149	55161	55174	55187	55200
5408.3	55212	55225	55238	55250	55263	55276	55288	55301	55314	55326
5408.4	55339	55352	55365	55377	55390	55403	55415	55428	55441	55453
5408.5	55466	55479	55492	55504	55517	55530	55542	55555	55568	55580
5408.6	55593	55606	55619	55631	55644	55657	55669	55682	55695	55707
5408.7	55720	55733	55745	55758	55771	55784	55796	55809	55822	55834
5408.8	55847	55860	55872	55885	55898	55911	55923	55936	55949	55961
5408.9	55974	55987	55999	56012	56025	56037	56050	56063	56076	56088
5409.0	56101	56114	56126	56139	56152	56164	56177	56190	56203	56215
5409.1	56228	56241	56253	56266	56279	56291	56304	56317	56329	56342
5409.2	56355	56368	56380	56393	56406	56418	56431	56444	56456	56469
5409.3	56482	56495	56507	56520	56533	56545	56558	56571	56583	56596
5409.4	56609	56621	56634	56647	56660	56672	56685	56698	56710	56723
5409.5	56736	56748	56761	56774	56787	56799	56812	56825	56837	56850
5409.6	56863	56875	56888	56901	56913	56926	56939	56952	56964	56977
5409.7	56990	57002	57015	57028	57040	57053	57066	57079	57091	57104
5409.8	57117	57129	57142	57155	57167	57180	57193	57206	57218	57231
5409.9	57244	57256	57269	57282	57294	57307	57320	57332	57345	57358



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**APPENDIX B**

**INSPECTION CHECKLIST**

DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION  
DAM SAFETY INSPECTION REPORT

NAME OF DAM \_\_\_\_\_  
DATE INSPECTED \_\_\_\_\_

INVENTORY NO. \_\_\_\_\_  
HAZARD CATEGORY \_\_\_\_\_  
TYPE OF DAM \_\_\_\_\_  
YEAR BUILT \_\_\_\_\_

OWNER \_\_\_\_\_  
OPERATOR \_\_\_\_\_  
STREAM \_\_\_\_\_  
DRAINAGE AREA \_\_\_\_\_

Reservoir Storage Status

	Water Surface Elevation (feet)	Storage (acre-feet)
At time of inspection	_____	_____
At spillway crest	_____	_____
At min. dam crest elevation	_____	_____
Flashboard crest elevation	_____	_____

ITEM	YES	NO	REMARKS	*ICC
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**1. EMBANKMENT**

A. Crest -- Height=                      Length=                      Width=

(1) Any visual settlements?				3
(2) Any misalignments?				4
(3) Any cracking?				1
(4) Any traffic damage?				5
(5) Other?				7

NOTE: \*ICC stands for "Inventory Comment Code" which is found on the Inventory of Montana Dams. This comment code is for use by the Dam Safety Section.

ITEM	YES	NO	REMARKS	*ICC
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1. EMBANKMENT (continued)

B. Upstream Face -- Slope=

(1) Any erosion?				13
(2) Any longitudinal cracks?				9
(3) Any transverse cracks?				9
(4) Is riprap protection adequate?				10
(5) Any stone deterioration?				10
(6) Any visual settlement, slumps, sloughing, depressions or bulges?				9
(7) Adequate grass cover?				14
(8) Debris on the dam face?				15
(9) Other?				16

C. Downstream Face--Slope=

(1) Any erosion?				22
(2) Any longitudinal cracks?				10
(3) Any transverse cracks?				10
(4) Any visual settlement, sloughing, slumps, depressions or bulges?				19
(5) Is the toe drain dry?				31
(6) Are the relief wells flowing?				31
(7) Any boils at the toe?				18
(8) Any seepage areas?				17, 18
(9) Any traffic or animal damage?				22
(10) Any burrowing animals?				21
(11) Adequate grass cover?				24
(12) Other?				25

D. Amount and Type of Vegetation on the Dam

	14, 24
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ITEM	YES	NO	REMARKS	*ICC
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## 2. ABUTMENT CONTACTS

(A) Any erosion?				12, 20
(B) Any visual differential movement?				12, 20
(C) Any cracks?				12, 20
(D) Any seepage present?				36
(E) Other?				16, 25

## 3. OUTLET WORKS

### A. Intake Structure -- Size=

(1) Any settlement?				70
(2) Any tilting?				70
(3) Do concrete surfaces show:				
a. Spalling?				70
b. Cracking?				70
c. Erosion?				70
d. Exposed reinforcement?				70
(4) Do joints show:				
a. Displacement or offset?				70
b. Loss of joint material?				70
c. Leakage?				70
(5) Metal appurtenances:				
a. Any corrosion present?				70
b. Any breakage present?				70
(6) Trash rack?				71
a. Condition?				71
b. Anchor system secure?				71
(7) Other?				71

ITEM	YES	NO	REMARKS	ICC
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### 3. OUTLET WORKS (continued)

B. Conduit -- Type =

Size =

(1) Do concrete surfaces show:				
a. Spalling?				76
b. Cracking?				76
c. Erosion?				76
d. Exposed reinforcement?				76
(2) Do joints show:				
a. Displacement or offset?				76
b. Loss of joint material?				76
c. Leakage?				76
(3) Is the conduit metal?				76
a. Any corrosion present?				76
b. Protective coatings adequate?				76
(4) Is the conduit misaligned?				76
(5) Any calcium deposits?				76
(6) Other?				76

### C. Gates and Tower

(1) Gates:				73, 74
a. Size: Operating:			Emergency:	
b. Type: Operating:			Emergency:	
(2) Controls operational?				76
(3) Controls lubricated?				76
(4) Operational problems?				76
(5) Leakage around gates?				73, 74
(6) Condition of gate seals?				73, 74
(7) Any cavitation damage? If so, describe?				73, 74
(8) Describe air vent-size and condition.				73, 74

ITEM	YES	NO	REMARKS	*ICC
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### 3. OUTLET WORKS

#### C. Gates and Tower (continued)

(9) Is there a jet pump?				62
a. Is it operational?				62
b. Leakage?				82
(10) Is the tower dry?      wet?				77
(11) Any seepage in the tower?				77
(12) Condition of the tower?				77
(13) Any safety problems?				77
(14) Ladder in good condition?				77
(15) Condition of the gate house?				81
(16) Emergency plan completed for the dam?				43
a. Posted in the gatehouse?				43
(17) Other?				82

#### D. Stilling Basin

(1) Do concrete surfaces show:				
a. Spalling?				62
b. Cracking?				62
c. Erosion?				62
d. Exposed reinforcement?				62
(2) Do joints show:				
a. Displacement or offset?				62
b. Loss of joint material?				62
c. Leakage?				62
(3) Do energy dissipators show:				
a. Signs of deterioration?				62
b. Are they covered with debris?				62
(4) Other?				63



ITEM	YES	NO	REMARKS	*ICC
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### 3. OUTLET WORKS (continued)

#### E. Downstream Channel

(1) Is the channel:				
a. Eroding or backcutting?				38
b. Sloughing?				38
c. Obstructed?				40
(2) Is released water:				
a. Undercutting the outlet?				52, 62
b. Eroding the embankment?				52, 62
(3) Other?				56, 63

### 4. SPILLWAY

#### A. Description

(1) Location?				N/A
(2) Type of Spillway?				N/A
(3) Size of Spillway?				N/A
(4) Spillway lining?				N/A
(5) Is there a weir?				61
(6) Is the spillway in good condition?				N/A
(7) Any drains?				N/A
a. Describe the condition of drains.				64

#### B. Does spillway show:

(1) Any cracking concrete?				57, 58
(2) Any spalling concrete?				57, 58
(3) Any exposed reinforcement in the concrete?				57, 58
(4) Any erosion?				52

ITEM	YES	NO	REMARKS	*ICC
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4. B. Does spillway show: (continued)

(5) Any slope sloughing?				51
(6) Any obstructions?				54
(7) Displacement or offset joints?				59
(8) Loss of joint material?				57, 58
(9) Leakage at the joints?				57, 58
(10) Other?				63

C. Do the energy dissipators show:

(1) Signs of deterioration?				62
(2) Any cracking?				62
(3) Any spalling?				62
(4) Any exposed reinforcement?				62
(5) Are they covered with debris?				62
(6) Other?				64

D. Has release water:

(1) Eroded the embankment?				52
(2) Undercut the outlet?				52
(3) Eroded the downstream channel?				52
(4) Other?				56

E. Emergency Spillway

(1) Is there an emergency spillway?			(If YES, describe)	55

ITEM	YES	NO	REMARKS	'ICC
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#### 5. RESERVOIR CONTROL

(A) Recent upstream development?				47
(B) Recent downstream development?				42
(C) Slides in reservoir area?				44
(D) Change in reservoir operation?				48
(E) Large impoundment upstream?				49
(F) Any debris in the reservoir?				50
(G) Other?				50

#### 6. INSTRUMENTATION

(A) List type(s) of instrumentation:				27-33
(B) In good condition?				27-33
(C) Read periodically?				27-33
(D) Is data available?				27-33
(E) Include all data gathered since last report.				

#### 7. DOWNSTREAM CONDITION

##### A. Downstream Land Use.

	41
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This dam was inspected by:

Additional comments and recommendations. (Use additional pages)



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**APPENDIX C**

**RUBY RIVER RESERVOIR GUIDELINES**

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## RUBY RIVER RESERVOIR GUIDELINES

The reservoir is to be operated within the guidelines outlined below.

### **Regulate Outflow**

- Goals:*
- Satisfy contracts.<sup>1</sup>
  - Minimize erosion and downstream flooding.
  - Prevent dewatering of the Ruby River downstream from the reservoir.

- Guidelines:*
1. The maximum sustainable outflow is 18,000 miner's inches (450 cfs). This rate can be exceeded up to a maximum of 24,000 miner's inches (600 cfs) for short periods of time.
  2. A minimum flow of 800 to 1,200 miner's inches (20-30 cfs) must be maintained at the dam outlet.
  3. If there is a demand from decreed water users, the amount of the inflow to the dam shall be allowed to flow out of the reservoir and past the diversion dam.
  4. The RRWUA will work with contract holders, decreed water users and the DNRC to implement the Water Delivery and Dewatering Prevention Plan for the Ruby River.
  5. The RRWUA shall notify the DNRC when flows drop to key points identified in the Water Delivery and Dewatering Prevention Plan. Staff gage readings from the following bridges will also be reported to the DNRC as noted in the plan: Coy Brown, Alder, Laurin, Silver Springs, Harrington and Wheatley.

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<sup>1</sup> Peak irrigation demand is typically 20,000 to 25,000 miner's inches (500 to 625 cfs). In mid-July irrigation demands decrease to 12,000 to 15,000 miner's inches (300 to 375 cfs).

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## **Regulate Reservoir Elevations**

- Goals:**
- ° Provide stored water to fulfill contracts.
  - ° Prevent sediment from washing out of the reservoir and adversely affecting water quality downstream by maintaining a minimum pool in the reservoir.

**Guidelines:**

1. By April 1 of each year, the RRWUA and the DNRC shall meet to evaluate reservoir storage, snowpack, streamflow, streamflow forecast, soil moisture and the weather forecast.

If the reservoir elevation is higher than average<sup>2</sup> and indications are that a wet, high runoff spring could exist, the RRWUA and the DNRC will consider increasing the outflow to provide some capacity for flood control and also to postpone the spill so that it coincides with peak irrigation demand.

If the reservoir elevation is lower than average and conditions indicate that a dry, low runoff spring<sup>3</sup> could exist, the RRWUA and DNRC will evaluate alternatives for allocating water to ensure that water is available throughout the irrigation season.

2. The RRWUA will notify the DNRC when the free-flow or natural flow period has ended and the RRWUA begins to satisfy contracts for stored water.
3. If the amount of water in the reservoir drops to 7,500 acre-feet, representatives of the RRWUA, the DNRC and the Department of Fish, Wildlife and Parks will meet to

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<sup>2</sup> 5,384 feet.

<sup>3</sup> For example, dry conditions existed during the years 1988, 1992 and 1994. Conditions during these years can be used for comparison purposes.

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discuss future operation of the reservoir and to determine what accommodations need to be made in order to maintain a minimum pool. The DNRC will establish a benchmark at the corresponding elevation.

4. The reservoir storage may not be drawn down below 2,600 acre-feet, which is the absolute minimum pool. The DNRC will establish a benchmark at the corresponding elevation.
5. The RRWUA will report to the DNRC every two weeks on the current reservoir elevation.

### **Emergency Response**

*Goals:*     ° Provide maximum early warning in the event of a failure of the Ruby Dam. Minimize loss of life or property.

*Guidelines:* 1. The RRWUA will follow the Emergency Plan for the Ruby Reservoir.

### **Maintenance**

*Goals:*     ° Maintain the dam in good condition so that it will continue to fulfill its function of providing a reliable source of irrigation water.

- ° Maintain the dam in good condition so as to minimize the risk to life or property downstream of the dam.

*Guidelines:* 1. The RRWUA will operate and maintain the reservoir in accordance with the Ruby River Reservoir Manual for Operation and Maintenance.



